Maintenance and Service Guide

HP Pavilion dv5100 Notebook PC

Document Part Number: 405500-001

February 2006

This guide is a troubleshooting reference used for maintaining and servicing the computer. It provides comprehensive information on identifying computer features, components, and spare parts; troubleshooting computer problems; and performing computer disassembly procedures.

© Copyright 2006 Hewlett-Packard Development Company, L.P.

Microsoft and Windows are U.S. registered trademarks of Microsoft Corporation. Intel and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license. SD Logo is a trademark of its proprietor.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Maintenance and Service Guide
HP Pavilion dv5100 Notebook PC
First Edition: February 2006
Document Part Number: 405500-001

Contents

1 Product Description

1.1 Features 1–2
1.2 Resetting the Computer 1–4
1.3 Power Management 1–5
1.4 External Components 1–6
1.5 Design Overview 1–20

2 Troubleshooting

2.1 Computer Setup 2–1
Accessing Computer Setup 2–2
Computer Setup Defaults 2–2
Selecting from the File Menu 2–3
Selecting from the Security Menu 2–4
Selecting from the Tools Menu 2–5
Selecting from the Advanced Menu 2–6
2.2 Troubleshooting Flowcharts 2–7

3 Illustrated Parts Catalog

3.1 Serial Number Location 3–1
3.2 Computer Major Components 3–2
3.3 Display Assembly Subcomponents 3–14
3.4 Plastics Kit 3–16
3.5 Cable Kit 3–17
3.6 Mass Storage Devices 3–18
3.7 Miscellaneous (Not Illustrated) 3–20
3.8 Sequential Part Number Listing 3–22

4 Removal and Replacement Preliminaries

4.1 Tools Required 4–1
4.2 Service Considerations 4–2
Plastic Parts 4–2
Cables and Connectors 4–2
4.3 Preventing Damage to Removable Drives 4–3
4.4 Preventing Electrostatic Damage 4–4
4.5 Packaging and Transporting Precautions 4–5
4.6 Workstation Precautions 4–6
4.7 Grounding Equipment and Methods 4–7

5 Removal and Replacement Procedures

5.1 Serial Number 5–1
5.2 Disassembly Sequence Chart 5–2
5.3 Preparing the Computer for Disassembly 5–4
5.4 Hard Drive. 5–6
5.5 Computer Feet. 5–9
5.6 Memory Module 5–10
5.7 Mini Card Module. 5–12
5.8 RTC Battery 5–15
5.9 Optical Drive. 5–16
5.10 Switch Cover. 5–18
5.11 Keyboard Frame 5–20
5.12 LED Board 5–24
5.13 Keyboard. 5–26
5.14 Display Assembly 5–28
5.15 Top Cover 5–39
5.16 Bluetooth Module 5–46
5.17 System Board 5–48
5.18 USB/Audio Board. 5–56
5.19 Fan/Heat Sink Assembly. 5–58
5.20 Processor 5–63
5.21 Speakers 5–65
5.22 PC Card Assembly 5–67
5.23 ExpressCard Assembly 5–70

6 Specifications

A Connector Pin Assignments

B Power Cord Set Requirements

C Screw Listing

D Display Component Recycling

Index

1

Product Description

The HP Pavilion dv5100 Notebook PC offers advanced modularity, Intel® Pentium® M processors, and extensive multimedia support.

HP Pavilion dv5100 Notebook PC

1.1 Features

Numerous references are made throughout this *Maintenance and Service Guide* to "full-featured" and "defeatured" computer models. A model is considered to be full-featured if it has 3 Universal Serial Bus ports and the following components:

- PC Card slot
- IEEE 1394 port
- Digital Media Slot

A model is considered to be defeatured if it has only two Universal Serial Bus ports and none of the components listed above.

- Intel Pentium M 2.0-GHz, 1.83-GHz, 1.66-GHz Dual Code, or 1.66-GHz Single Code processors, varying by computer model
- 15.4-inch, WXGA, TFT (1280 × 800) display with antiglare or BrightView, varying by computer model
- 100-, 80-, 60-, or 40-GB high-capacity hard drive, varying by computer model
- 256-MB DDR1 synchronous DRAM (SDRAM) at 333 MHz, expandable to 2.0 GB
- Microsoft® Windows® XP Home Edition or Windows XP Professional, varying by computer model
- Full-size Windows keyboard with embedded numeric keypad
- TouchPad pointing device, including dedicated vertical scroll region
- Integrated 10Base-T/100Base-TX Ethernet local area network (LAN) network interface card (NIC) with RJ-45 jack
- Integrated high-speed 56K modem with RJ-11 jack
- Integrated wireless support for Mini Card IEEE 802.11a/b/g WLAN device

- Support for one Type I or Type II PC Card slot, with support for both 32-bit (CardBus) and 16-bit PC Cards
- Support for ExpressCard slot
- External 65-watt AC adapter with 3-wire power cord
- 12- or 6-cell Li-Ion battery pack
- Stereo speakers
- Volume up, volume mute, and volume down buttons
- Support for the following optical drives:
  - DVD±RW and CD-RW Double Layer Combo Drive with LightScribe
  - DVD±RW and CD-RW Double Layer Combo Drive
  - DVD/CD-RW Combo Drive
- Connectors:
  - Audio-in (microphone)
  - Audio-out (headphone)
  - Digital Media Slot (select models only)
  - Expansion port 2
  - ExpressCard slot
  - External monitor
  - IEEE 1394 (select models only)
  - PC Card (select models only)
  - Power
  - RJ-11 (modem)
  - RJ-45 (network)
  - S-Video-out
  - Universal Serial Bus (USB) v. 2.0 (2 or 3 ports, varying by computer model)

1.2 Resetting the Computer

If the computer you are servicing has an unknown password, follow these steps to clear the password. These steps also clear CMOS:

1. Prepare the computer for disassembly (refer to Section 5.3, "Preparing the Computer for Disassembly," for more information.)
2. Remove the real-time clock (RTC) battery (refer to Section 5.8, "RTC Battery," for more information.)
3. Wait approximately 5 minutes.
4. Replace the RTC battery and reassemble the computer.
5. Connect AC power to the computer. Do not reinsert any battery packs at this time.
6. Turn on the computer.

All passwords and CMOS settings have been cleared.

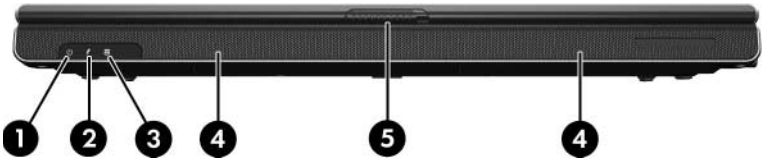
1.3 Power Management

The computer comes with power management features that extend battery operating time and conserve power. The computer supports the following power management features:

- Standby
- Hibernation
- Setting customization by the user
- Hotkeys for setting the level of performance
- Battery calibration
- Lid switch standby/resume
- Power button
- Advanced Configuration and Power Management (ACPM) compliance

1.4 External Components

The external components on the front of the computer are shown below and described in Table 1-1.



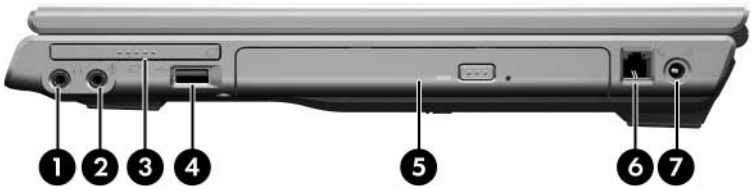
Front Components

Table 1-1

Front Components

Item	Component	Function
1	Power light	■ On: Computer is turned on. ■ Off: Computer is off or in hibernation. ■ Blinking: Computer is in standby.
2	Battery light	■ On: A battery pack is charging or is close to full charge capacity. ■ Off: If the computer is plugged into an external power source, the light is turned off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low-battery condition. ■ Blinking: A battery pack that is the only available power source has reached a low-battery condition. When the battery reaches a critical low-battery condition, the battery light begins blinking quickly.
3	Drive light	On or blinking: The internal hard drive or an optical drive is being accessed.
4	Speakers	Produce stereo sound.
5	Display release latch	Opens the computer.

The external components on the right side of the computer are shown below and described in Table 1-2.



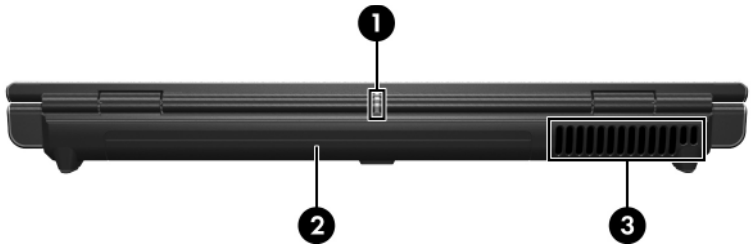
Right-Side Components

Table 1-2

Right-Side Components

Item	Component	Function
1	Audio-out (headphone) jack	Connects an optional headphone or powered stereo speakers. Also connects the audio function of an audio/video device, such as a television or VCR.
2	Audio-in (microphone) jack	Connects an optional stereo microphone.
3	ExpressCard slot	Supports an optional ExpressCard.
4	USB port (select models only)	Connects optional USB devices.
5	Optical drive	Supports an optical disc, such as a CD or DVD.
6	RJ-11 (modem) jack	Connects a modem cable (not included).
7	Power connector	Connects the AC adapter cable.

The external components on the rear panel of the computer are shown below and described in Table 1-3.



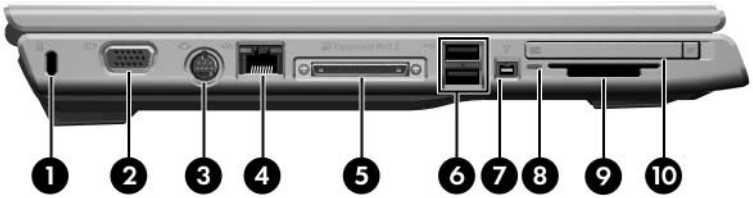
Rear Panel Components

Table 1-3

Rear Panel Components

Item	Component	Function
1	Wireless light	On: One or more internal wireless devices have been turned on. To establish a wireless connection, a wireless network must already be set up.
2	Battery bay	Holds a battery pack.
3	Vent	Provides airflow to cool internal components. To prevent overheating, do not obstruct vents. Do not allow a hard surface, such as a printer, or a soft surface, such as pillows or thick rugs or clothing, to block airflow.

The external components on the left side of the computer are shown below and described in Table 1-4.



Left-Side Components

Table 1-4

Left-Side Components

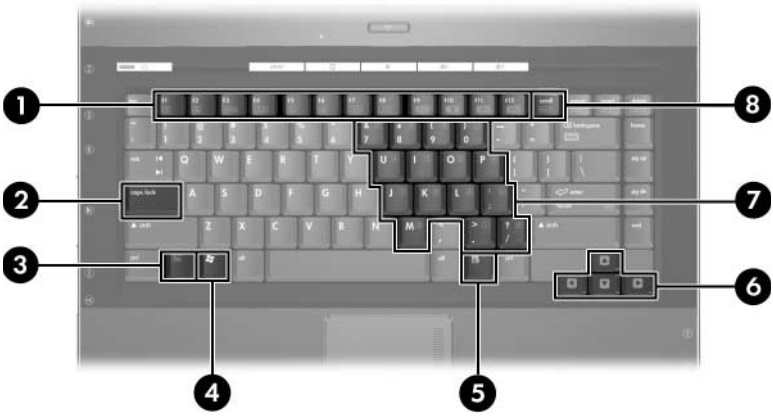
Item	Component	Function
1	Security cable slot	Attaches an optional security cable to the computer. ✎ The security cable is designed to act as a deterrent, but may not prevent the product from being mishandled or stolen.
2	Monitor port	Connects an optional VGA monitor or projector.
3	S-Video-out jack	Connects the video function of an optional S-Video device, such as a television, VCR, or video capture card.
4	RJ-45 (network) jack	Connects a network cable (not included).

Table 1-4

Left-Side Components *(Continued)*

Item	Component	Function
5	Expansion port 2	Connects the computer to an optional expansion product. ✎ The computer has only one expansion port. The term *expansion port 2* describes the type of expansion port.
6	USB ports (2)	Connect optional USB devices.
7	1394 port (select models only))	Connects an optional 1394a device such as a scanner, a digital camera, or a digital camcorder.
8	Digital Media Slot light (select models only)	On: An optional digital card is being accessed.
9	Digital Media Slot (select models only)	Supports the following optional digital cards: Secure Digital (SD) Memory Card, SD I/O Card, Memory Stick, Memory Stick Pro, MultiMediaCard, xD-Picture Card, and SmartMedia.
10	PC Card slot (select models only)	Supports an optional Type I or Type II 32-bit (CardBus) or 16-bit PC Card.

The standard keyboard components of the computer are shown below and described in Table 1-5.



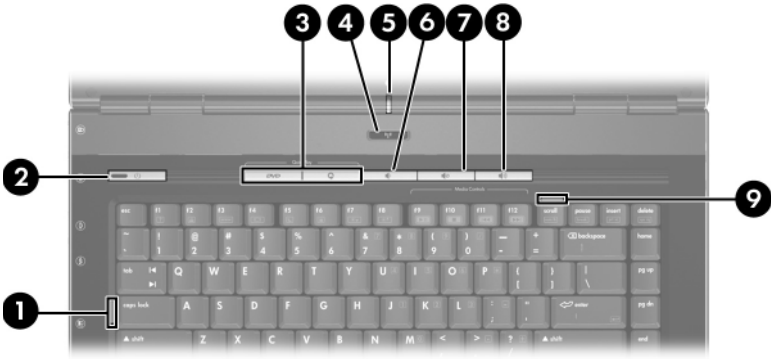
Standard Keyboard Components

Table 1-5

Standard Keyboard Components

Item	Component	Function
1	**f1** to **f12** keys (12)	Perform system and application tasks. When combined with **fn**, function keys perform additional tasks as hotkeys.
2	**caps lock** key	Enables caps lock and turns on the caps lock light.
3	**fn** key	Combines with other keys to perform system tasks as hotkeys. For example, pressing **fn+f7** decreases screen brightness.
4	Windows logo key	Displays the Microsoft Windows Start menu.
5	Windows applications key	Displays a shortcut menu for items beneath the pointer.
6	Arrow keys	Move the cursor around the screen.
7	Numeric keypad keys (15)	Can be used like the keys on an external numeric keypad.
8	**num lock** key	Enables numeric lock, turns on the embedded numeric keypad, and turns on the num lock light.

The computer top components are shown below and described in Table 1-6.



Top Components

Table 1-6

Top Components

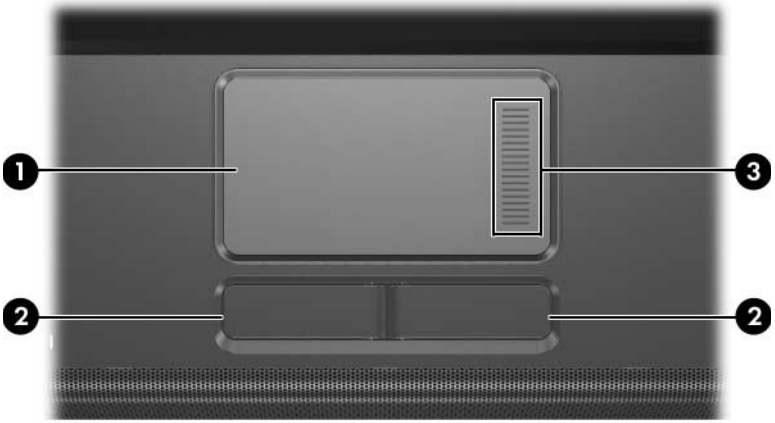
Item	Component	Function
1	Caps lock light	On: Caps lock is enabled.
2	Power light	■ On: The computer is on. ■ Blinking: The computer is in standby. ■ Off: The computer is off or in hibernation.

Table 1-6

Top Components *(Continued)*

Item	Component	Function
2	Power button	When the computer is ■ Off, press to turn on the computer. ■ On, press to enter hibernation. ■ In standby, briefly press to exit standby. ■ In hibernation, briefly press to exit hibernation. If the computer has stopped responding and Microsoft® Windows® shutdown procedures cannot be used, press and hold the power button for at least 5 seconds to turn off the computer.
3	QuickLaunch buttons	Launch default multimedia, digital imaging, or music applications.
4	Wireless button	Turns the wireless functionality on or off, but does not create a wireless connection. ✎ To establish a wireless connection, a wireless network must already be set up.
5	Wireless light	On: One or more internal wireless devices have been turned on. ✎ To establish a wireless connection, a wireless network must already be set up.
6	Volume down button	Decreases speaker volume.
7	Volume mute button	Mutes or restores speaker volume.
8	Volume up button	Increases speaker volume.
9	Num lock light	On: Num lock is enabled.

The computer TouchPad components are shown below and described in Table 1-7.



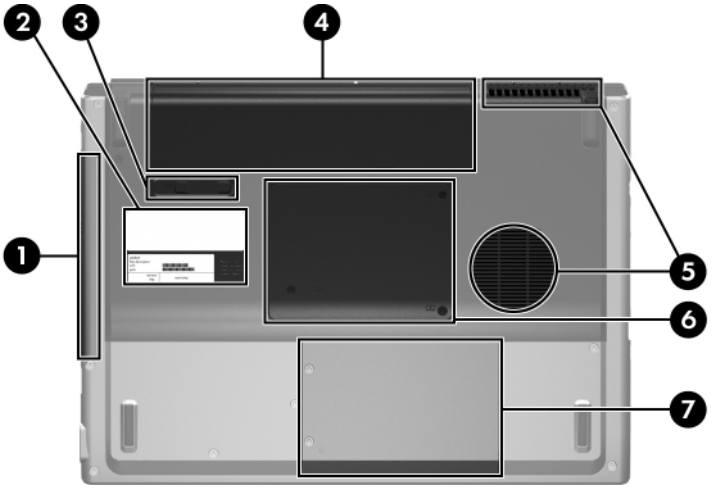
TouchPad Components

Table 1-7

TouchPad Components

Item	Component	Function
1	TouchPad	Moves the pointer and selects or activates items on the screen. Can be set to perform other mouse functions, such as scrolling, selecting, and double-clicking.
2	Left and right TouchPad buttons	Function like the left and right buttons on an external mouse.
3	TouchPad vertical scroll zone	Scrolls up or down.

The external components on the bottom of the computer are shown below and described in Table 1-8.



Bottom Components

Table 1-8

Bottom Components

Item	Component	Function
1	Optical drive	Supports an optical disc, such as a CD or DVD.
2	Labels area	Contains the serial number and other information labels.
3	Battery pack release latch	Releases a battery pack from the battery bay.
4	Battery bay	Holds a battery pack.

Table 1-8

Bottom Components *(Continued)*

Item	Component	Function
5	Vents (2)	Provide airflow to cool internal components. △ To prevent overheating, do not obstruct vents. Use the computer only on a hard, flat surface. Do not allow a another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or thick rugs or clothing, to block airflow.
6	Memory/Mini Card module compartment cover	■ Contains 2 memory module slots that support replaceable memory modules. The number of preinstalled memory modules varies by computer model. ■ Holds an optional wireless LAN device (select models only). △ To prevent an unresponsive system and the display of a warning message, install only a Mini Card device authorized for use in your computer by the governmental agency that regulates wireless devices in your country. If you install an unauthorized device and then receive a warning message, remove the device to restore computer functionality. Then contact Customer Care.
7	Hard drive bay	Holds the hard drive.

1.5 Design Overview

This section presents a design overview of key parts and features of the computer. Refer to Chapter 3, "Illustrated Parts Catalog," to identify replacement parts, and Chapter 5, "Removal and Replacement Procedures," for disassembly steps.

The system board provides the following device connections:

- Intel Pentium M processors
- Audio
- Digital media card
- Display
- ExpressCard
- Hard drive
- Keyboard
- Memory module
- Mini Card module
- PC Card
- TouchPad

CAUTION: To properly ventilate the computer, allow at least a 7.6-cm (3-inch) clearance on the left and right sides of the computer.

The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software applications. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

2

Troubleshooting

WARNING: Only authorized technicians trained by HP should repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly-/module-level repair. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indication of component replacement or printed wiring board modification may void any warranty or exchange allowances.

2.1 Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load. If the operating system is working, the computer restarts the operating system after you exit Computer Setup.

Pointing devices are not supported in Computer Setup; you must use the keyboard to navigate and make selections.

The menu tables later in this chapter provide an overview of Computer Setup options.

Accessing Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Tools, and Advanced menus.

1. Open Computer Setup by turning on or restarting the computer. Press **f10** while the F10 = Based Setup message is displayed in the lower-left corner of the screen.
   - ❏ To change the language, press **f2**.
   - ❏ To view navigation information, press **f1**.
   - ❏ To return to the Computer Setup menu, press **esc**.
2. Select the **File**, **Security**, **Tools**, or **Advanced** menu.
3. To exit Computer Setup, choose one of the following:
   - ❏ To exit without saving any changes, use the arrow keys to select **File > Ignore changes and exit**, and then follow the instructions on the screen.
   - ❏ To exit and save all the settings you have entered, use the arrow keys to select **File > Save changes and exit**, and then follow the instructions on the screen.

Your preferences are set when you exit Computer Setup and go into effect when the computer restarts.

Computer Setup Defaults

To restore all settings in Computer Setup to the values that were set at the factory:

1. Open Computer Setup by turning on or restarting the computer. Press **f10** while the F10 = Based Setup message is displayed in the lower-left corner of the screen.
   - ❏ To change the language, press **f2**.
   - ❏ To view navigation information, press **f1**.
2. Use the arrow keys to select **File > Restore defaults**.
3. Select the **Restore Defaults** check box.

4. To confirm the restoration, press **f10**.
5. Select **File > Save changes and exit**, and then follow the instructions on the screen.

When the computer restarts, the factory settings are restored, and any identification information you have entered is saved.

Selecting from the File Menu

Table 2-1

File Menu

Select	To Do This
System Information	■ View identification information about the computer and any battery packs in the system. ■ View specification information about the processor, memory and cache size, video revision, keyboard controller version, and system ROM.
Save to floppy	Save system configuration settings to a diskette.
Restore to floppy	Restore system configuration settings from a diskette.
Restore defaults	Replace configuration settings in Computer Setup with factory default settings. (Identification information is retained.)
Ignore changes and exit	Cancel changes entered during the current session. Then exit and restart the computer.
Save changes and exit	Save changes entered during the current session. Then exit and restart the computer. The changes you save go into effect when the computer restarts.

Selecting from the Security Menu

Table 2-2

Security Menu

Select	To Do This
Administrator password	Enter, change, or delete an HP Administrator password.
Power-on password	Enter, change, or delete a power-on password.
Password options	■ Enable/Disable stringent security. ■ Enable/Disable required password on restart.
DriveLock passwords	Enable/disable DriveLock; change a DriveLock user or master password. ✎ DriveLock Settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
Smart Card Security	Enable/disable power-on support for smart cards. ✎ This feature is supported by select smart card readers only.
Embedded Security	■ Enable/Disable the embedded security chip. ■ Restore embedded security chip to factory settings. ■ Enable/Disable power-on authentication support. ■ Enable/Disable automatic DriveLock. ■ Reset power-on authentication credential. ✎ Embedded Security settings are accessible only if the computer is equipped with an embedded security chip.
Device security	Enable/Disable devices in the system. Enable NIC for inclusion in MultiBoot.
System IDs	Enter user-defined identification values.

Selecting from the Tools Menu

Table 2-3

Tools Menu

Select	To Do This
HDD Self Test options	Run a quick or comprehensive self-test on any hard drive in the system.
Battery Information	View information about any battery packs in the computer.
Memory Check	■ Run a self-test on memory modules in the computer. ■ View information about memory modules installed in the computer.

Selecting from the Advanced Menu

Table 2-4

Advanced Menu

Select	To Do This
Language (or press **f2**)	Change the Computer Setup language.
Boot options	■ Enable/Disable MultiBoot, which sets a startup sequence that can include most bootable devices and media in the system. ■ Set the boot order.
Device options	■ Swap the functions of the **fn** key and left **ctrl** key. ■ Enable/Disable multiple pointing devices at startup. (To set the computer to support only a single, usually nonstandard, pointing device at startup, select **Disable**.) ■ Enable/Disable USB legacy support for a USB keyboard, mouse, and hub. When USB legacy support is enabled ❒ A USB keyboard, mouse, and hub work even when a Windows operating system is not loaded. ❒ The computer starts from a bootable hard drive, diskette drive diskette, or CD, CD-RW, or DVD inserted into a drive connected by a USB port to the computer or to an optional docking device. ■ Select a parallel port mode: EPP (Enhanced Parallel Port), standard, bidirectional, or ECP (Enhanced Capabilities Port). ■ Enable/Disable all settings in the **SpeedStep** window. (When Disable is selected, the computer runs in Battery Optimized mode.)

2.2 Troubleshooting Flowcharts

Table 2-5

Troubleshooting Flowcharts Overview

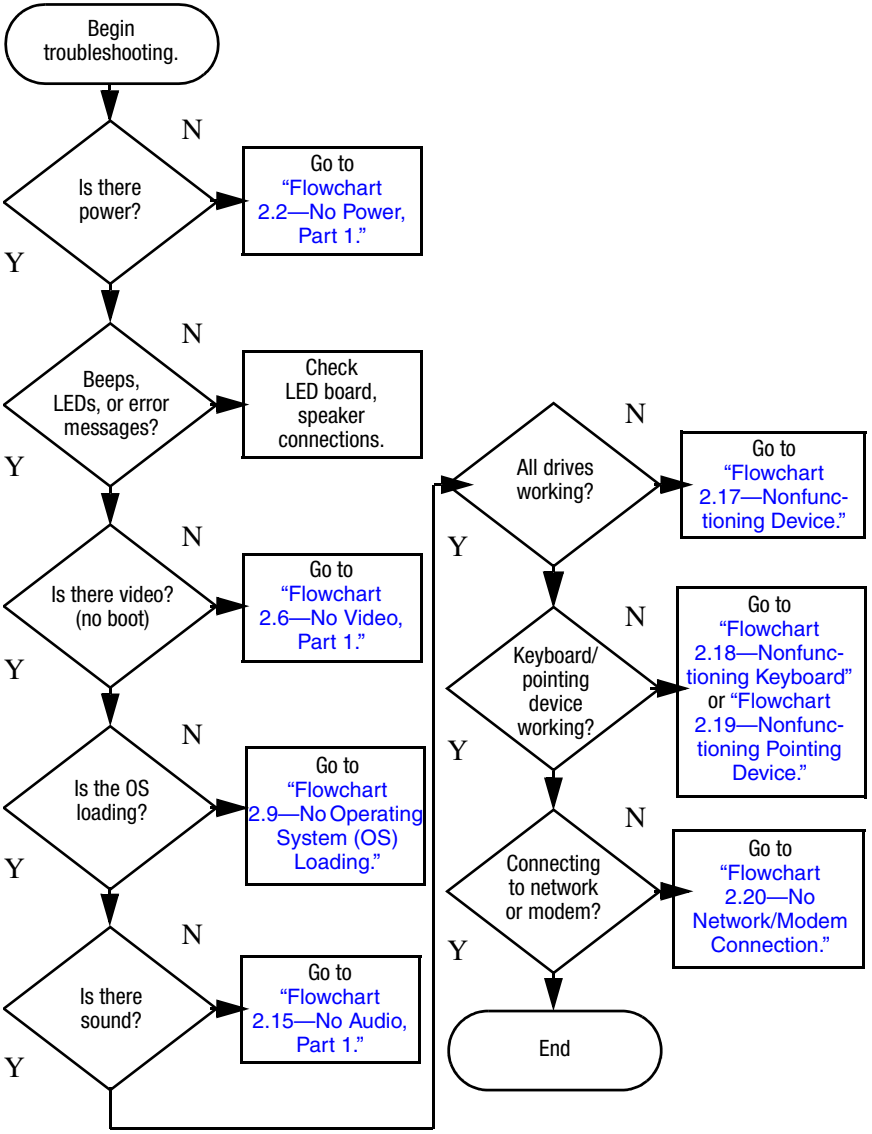
Flowchart	Description
2.1	“Flowchart 2.1—Initial Troubleshooting”
2.2	“Flowchart 2.2—No Power, Part 1”
2.3	“Flowchart 2.3—No Power, Part 2”
2.4	“Flowchart 2.4—No Power, Part 3”
2.5	“Flowchart 2.5—No Power, Part 4”
2.6	“Flowchart 2.6—No Video, Part 1”
2.7	“Flowchart 2.7—No Video, Part 2”
2.8	“Flowchart 2.8—Nonfunctioning Docking Device (if applicable)”
2.9	“Flowchart 2.9—No Operating System (OS) Loading”
2.10	“Flowchart 2.10—No OS Loading, Hard Drive, Part 1”
2.11	“Flowchart 2.11—No OS Loading, Hard Drive, Part 2”
2.12	“Flowchart 2.12—No OS Loading, Hard Drive, Part 3”
2.13	“Flowchart 2.13—No OS Loading, Diskette Drive”

Table 2-5

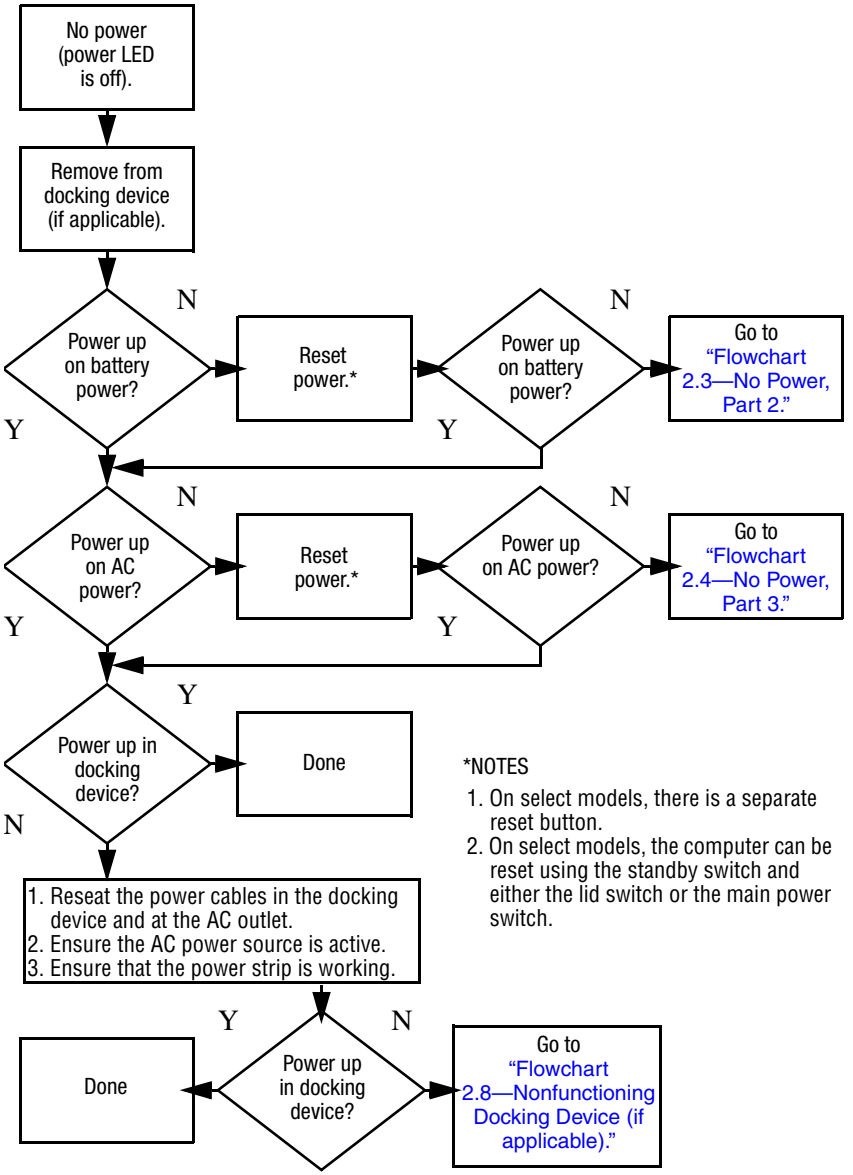
Troubleshooting Flowcharts Overview *(Continued)*

Flowchart	Description
2.14	“Flowchart 2.14—No OS Loading, Optical Drive”
2.15	“Flowchart 2.15—No Audio, Part 1”
2.16	“Flowchart 2.16—No Audio, Part 2”
2.17	“Flowchart 2.17—Nonfunctioning Device”
2.18	“Flowchart 2.18—Nonfunctioning Keyboard”
2.19	“Flowchart 2.19—Nonfunctioning Pointing Device”
2.20	“Flowchart 2.20—No Network/Modem Connection”

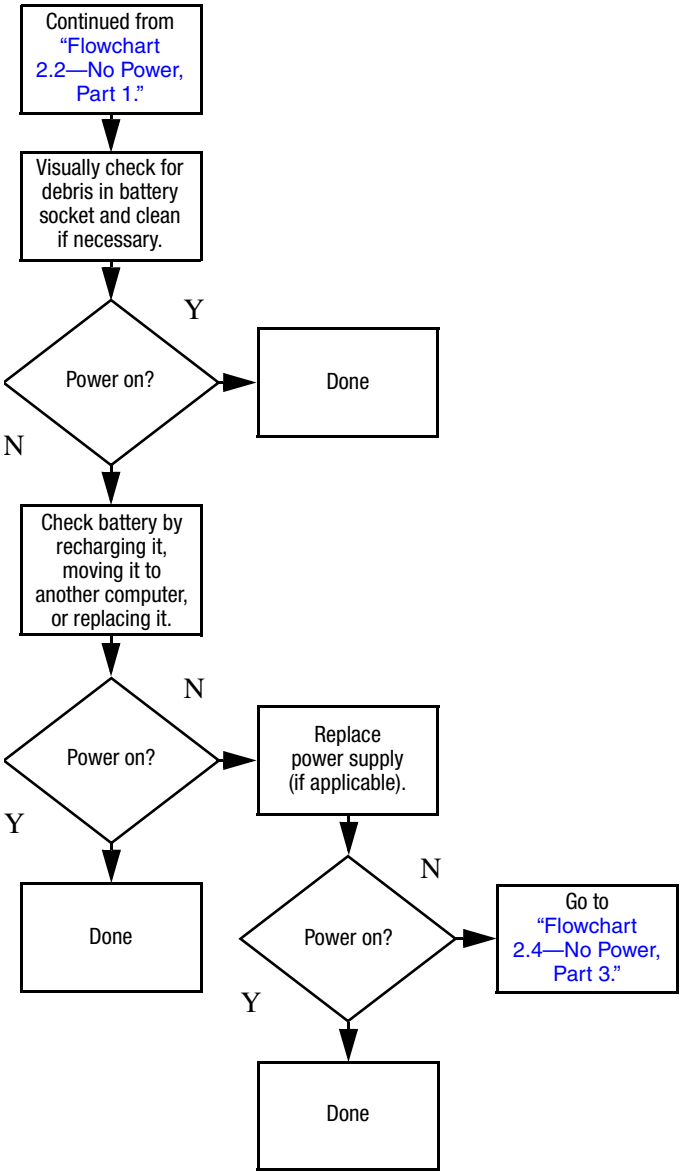
Flowchart 2.1—Initial Troubleshooting



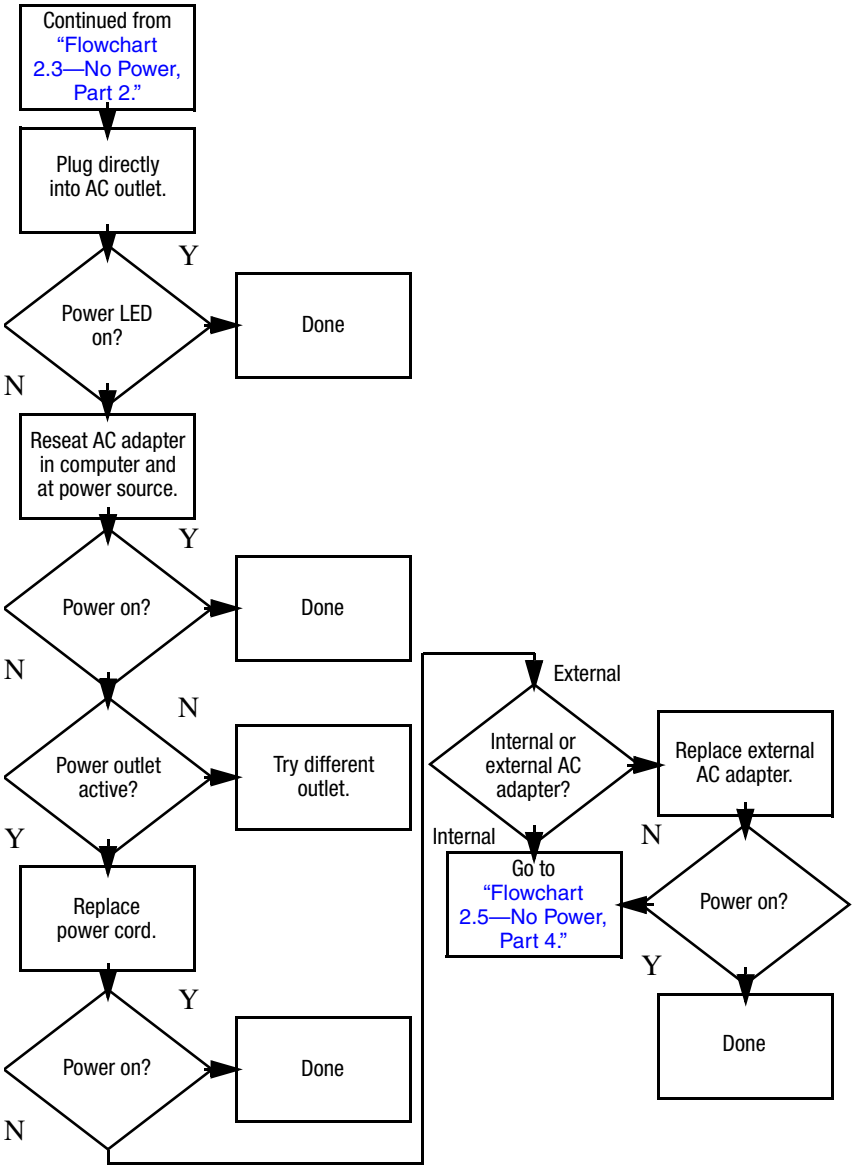
Flowchart 2.2—No Power, Part 1


No power (power LED is off).
Remove from docking device (if applicable).
Power up on battery power?
N
Y
Reset power.*
Power up on battery power?
N
Y
Go to "Flowchart 2.3—No Power, Part 2."
Power up on AC power?
N
Y
Reset power.*
Power up on AC power?
N
Y
Go to "Flowchart 2.4—No Power, Part 3."
Power up in docking device?
Y
N
Done
1. Reseat the power cables in the docking device and at the AC outlet.
2. Ensure the AC power source is active.
3. Ensure that the power strip is working.
Power up in docking device?
Y
N
Done
Go to "Flowchart 2.8—Nonfunctioning Docking Device (if applicable)."
*NOTES
1. On select models, there is a separate reset button.
2. On select models, the computer can be reset using the standby switch and either the lid switch or the main power switch.

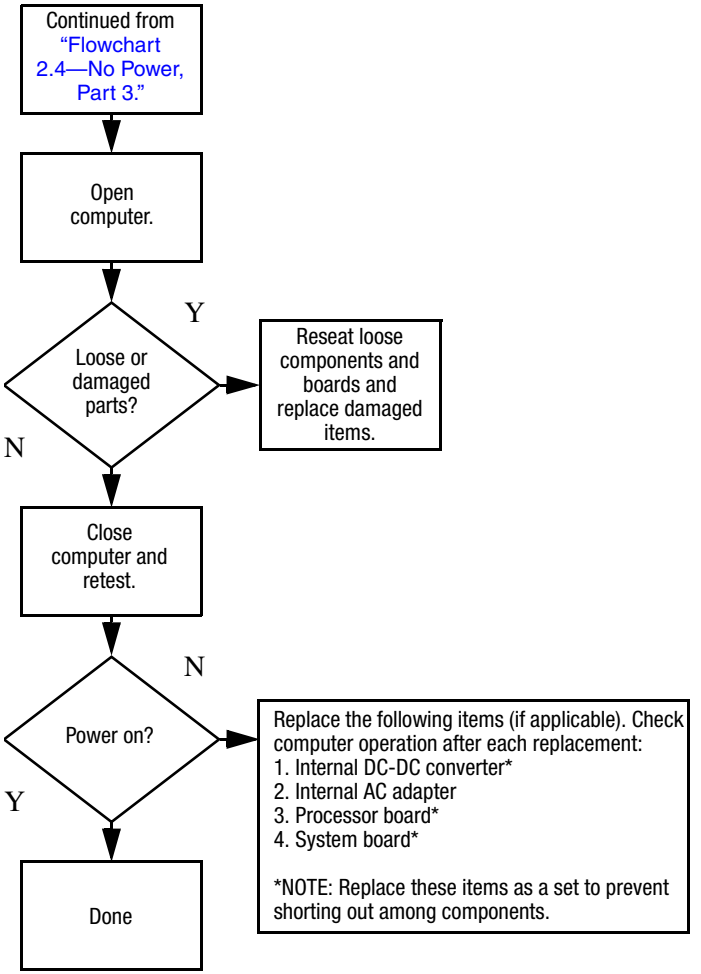
Flowchart 2.3—No Power, Part 2



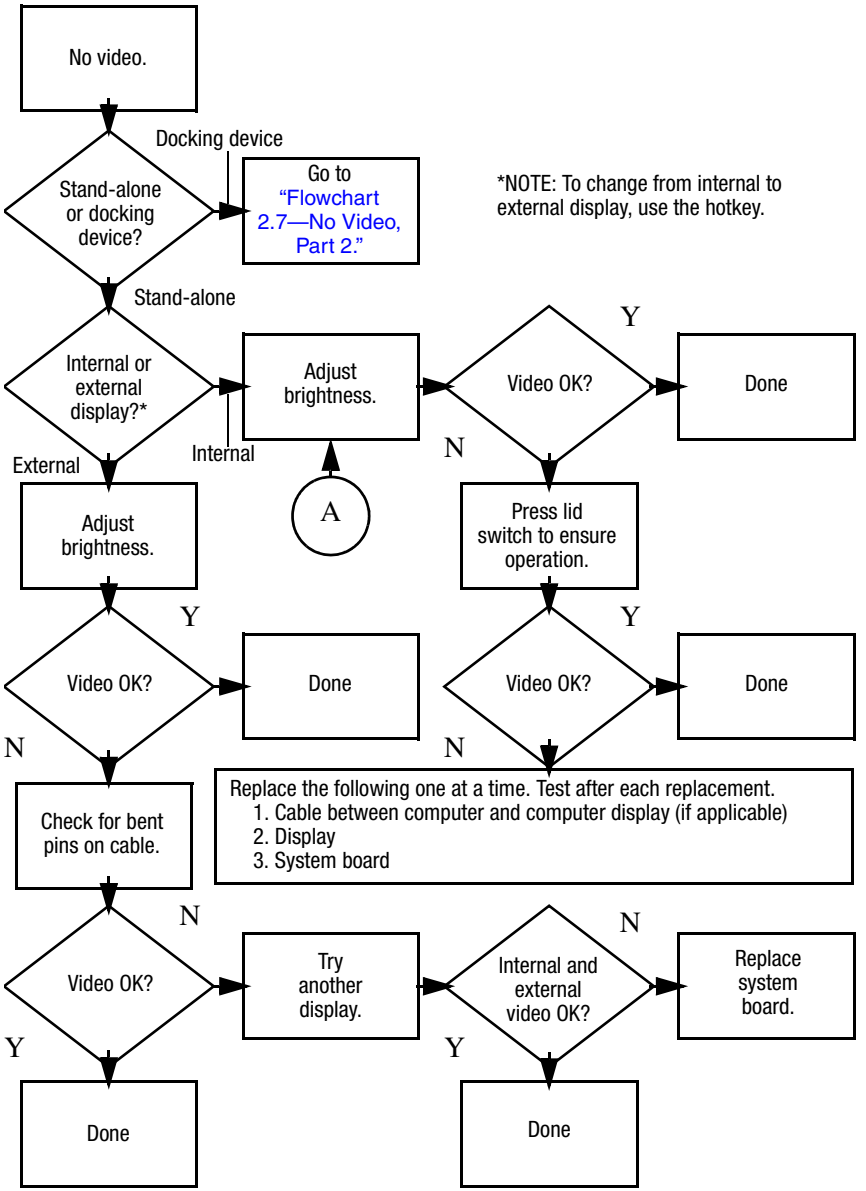
Flowchart 2.4—No Power, Part 3



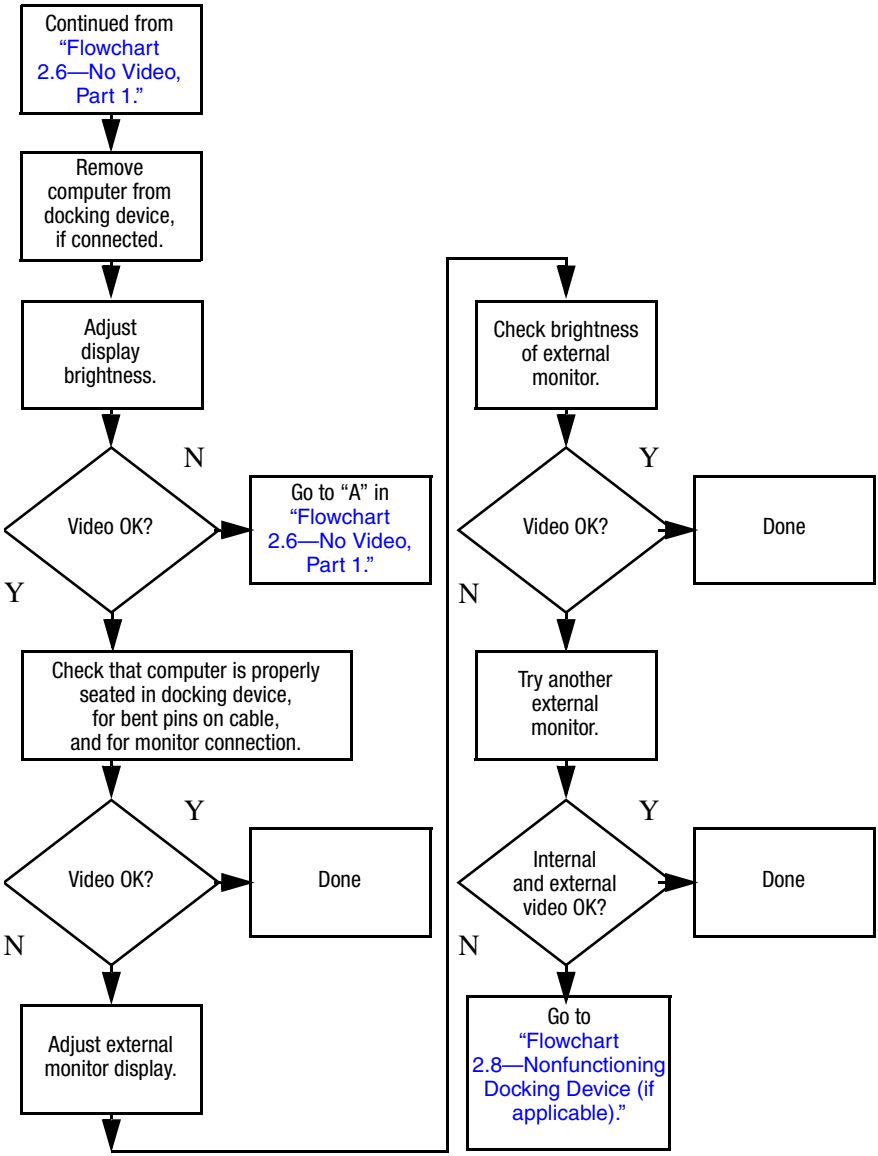
Flowchart 2.5—No Power, Part 4


Continued from "Flowchart 2.4—No Power, Part 3."
Open computer.
Loose or damaged parts?
Y
N
Reseat loose components and boards and replace damaged items.
Close computer and retest.
Power on?
N
Y
Replace the following items (if applicable). Check computer operation after each replacement:
1. Internal DC-DC converter*
2. Internal AC adapter
3. Processor board*
4. System board*
*NOTE: Replace these items as a set to prevent shorting out among components.
Done

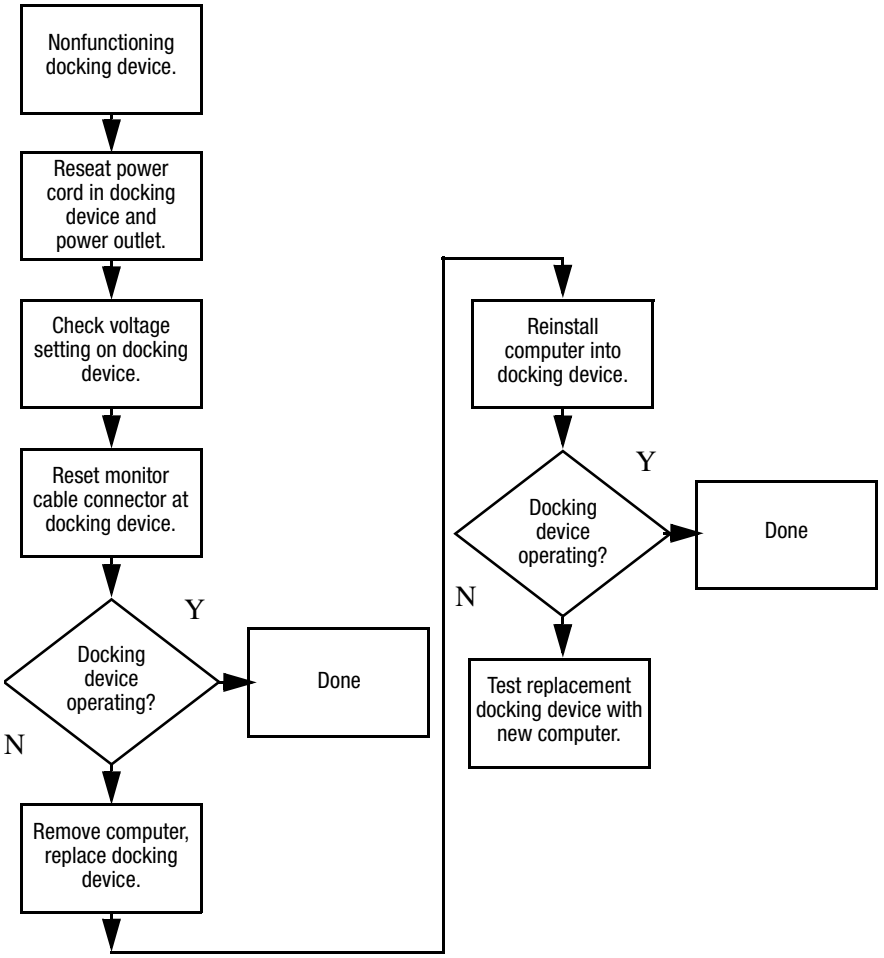
Flowchart 2.6—No Video, Part 1



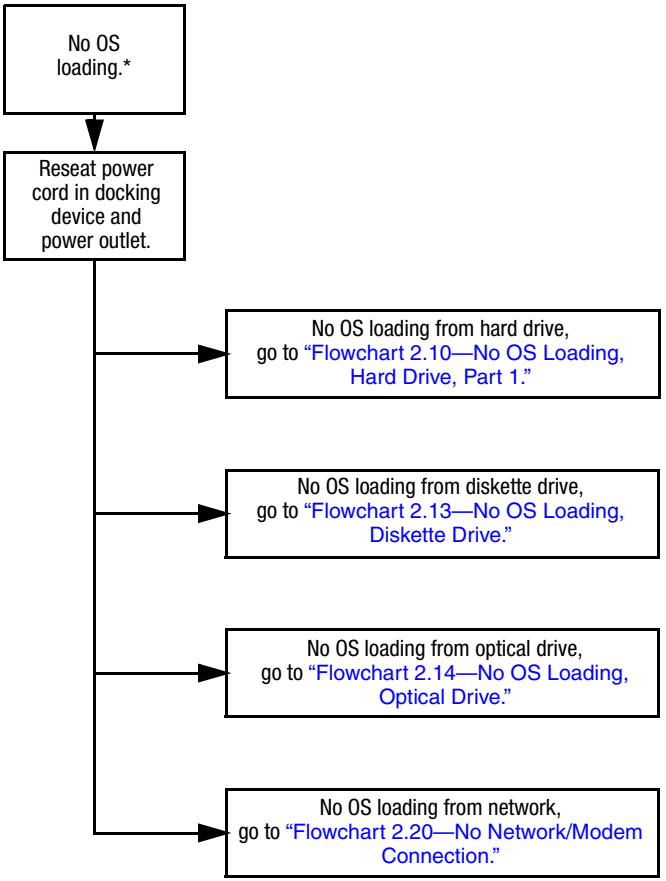
Flowchart 2.7—No Video, Part 2



Flowchart 2.8—Nonfunctioning Docking Device (if applicable)

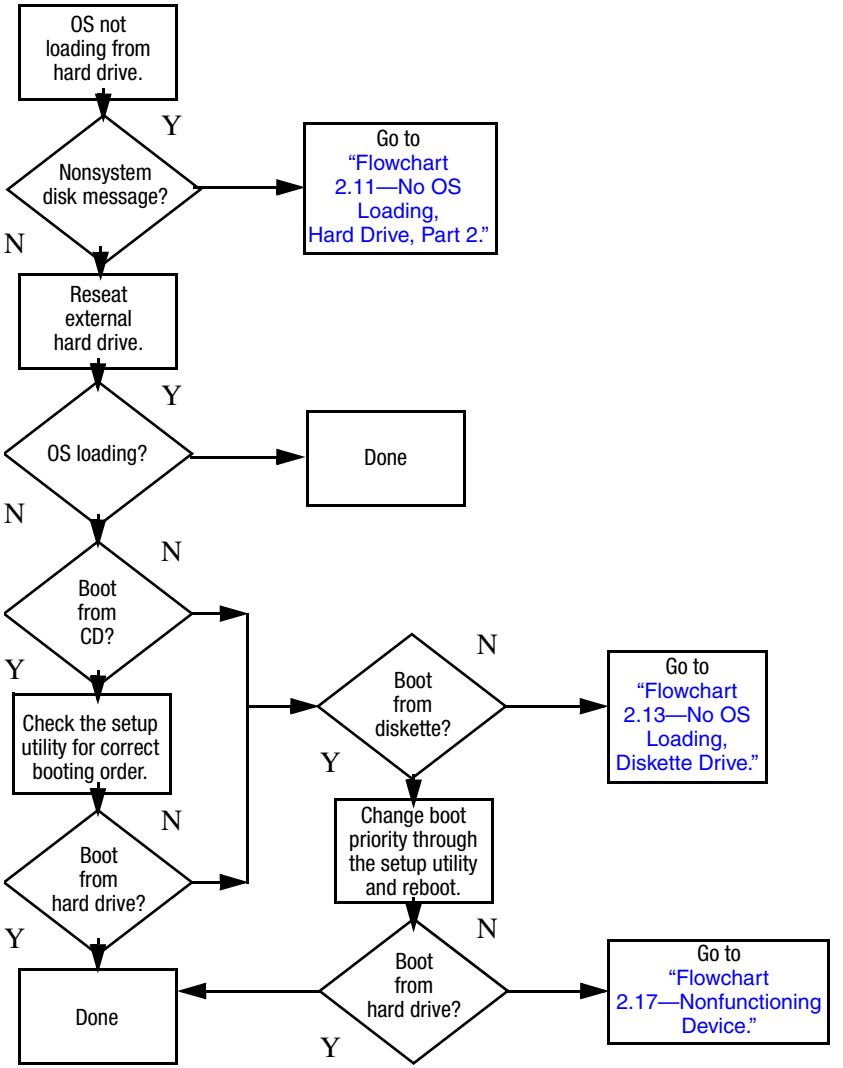


Flowchart 2.9—No Operating System (OS) Loading

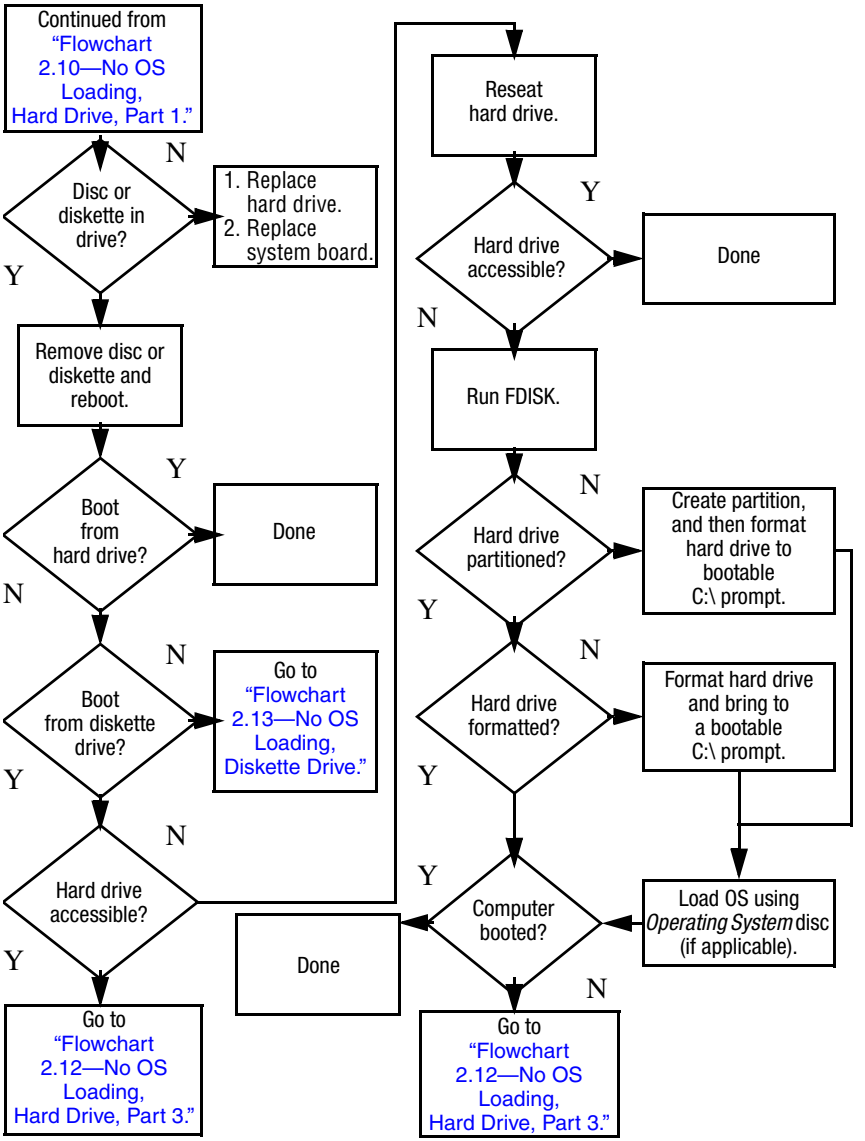

No OS loading.*
Reseat power cord in docking device and power outlet.
No OS loading from hard drive, go to "Flowchart 2.10—No OS Loading, Hard Drive, Part 1."
No OS loading from diskette drive, go to "Flowchart 2.13—No OS Loading, Diskette Drive."
No OS loading from optical drive, go to "Flowchart 2.14—No OS Loading, Optical Drive."
No OS loading from network, go to "Flowchart 2.20—No Network/Modem Connection."

*NOTE: Before beginning troubleshooting, always check cable connections, cable ends, and drives for bent or damaged pins.

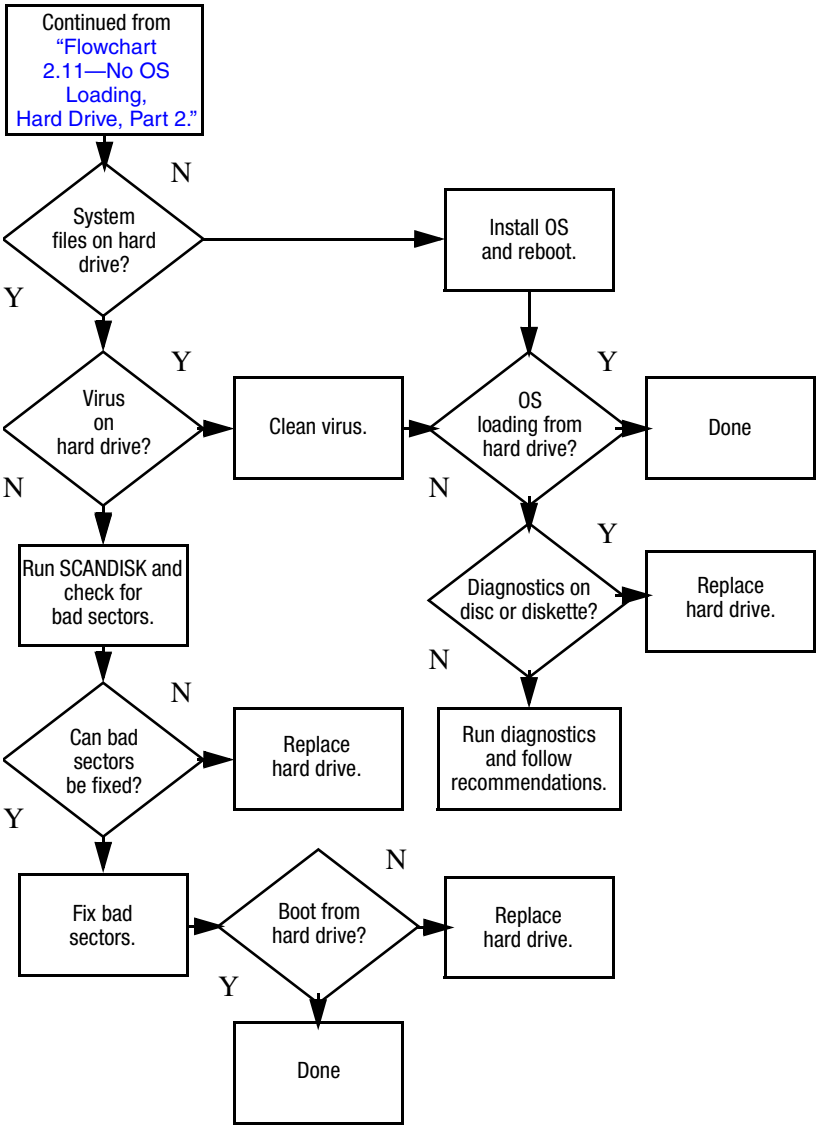
Flowchart 2.10—No OS Loading, Hard Drive, Part 1



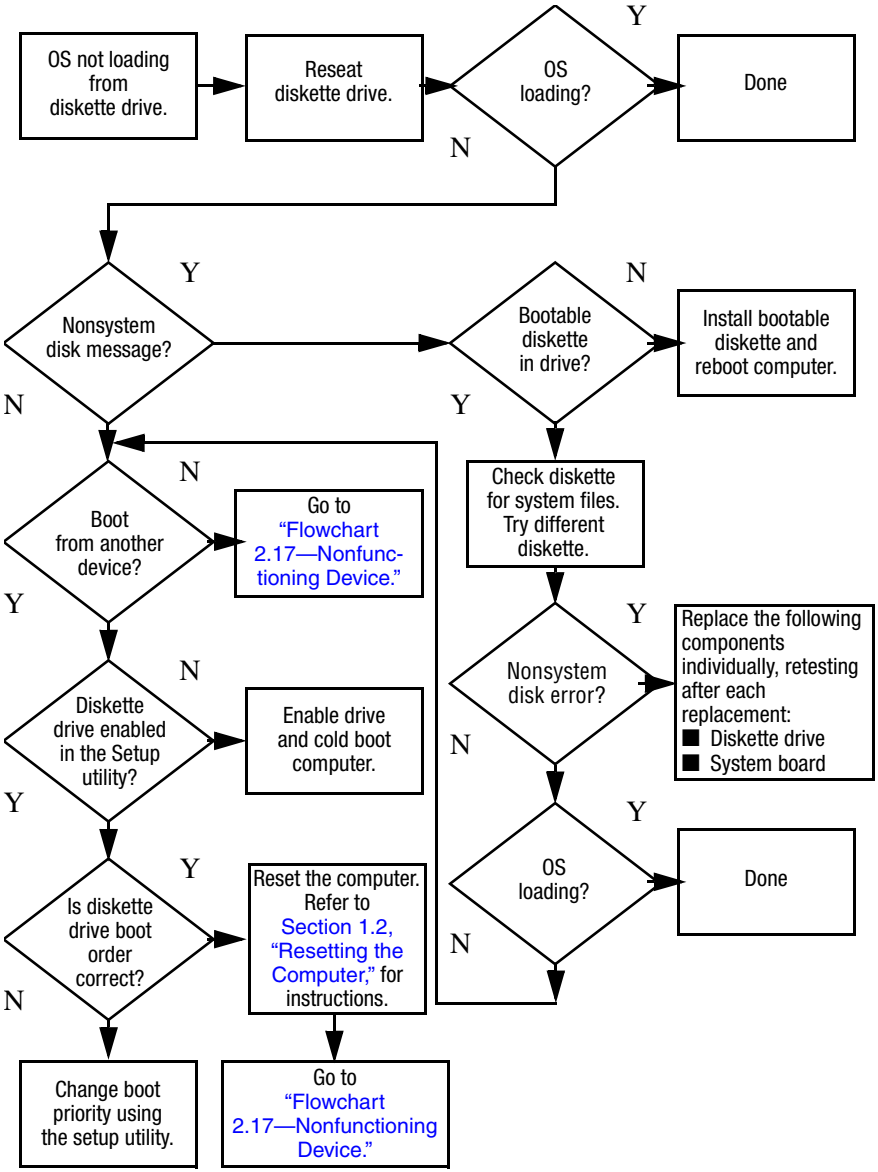
Flowchart 2.11—No OS Loading, Hard Drive, Part 2



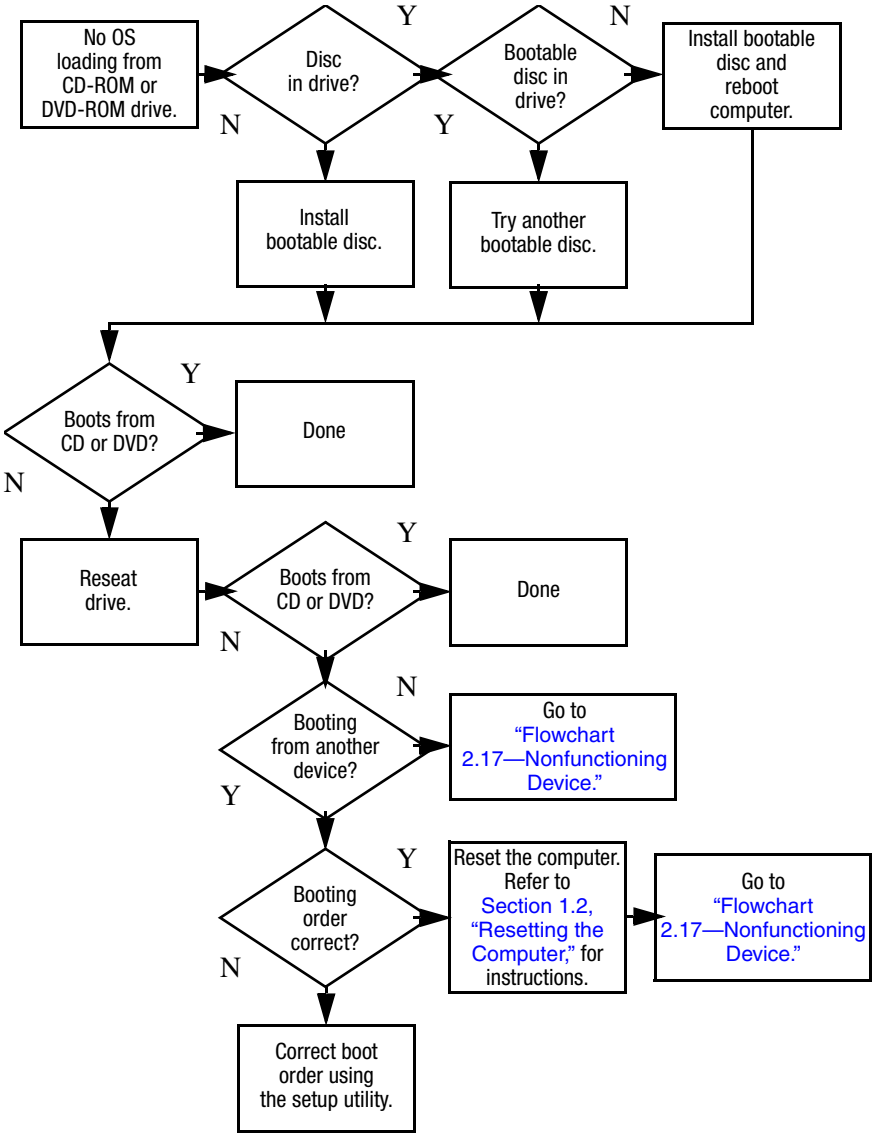
Flowchart 2.12—No OS Loading, Hard Drive, Part 3



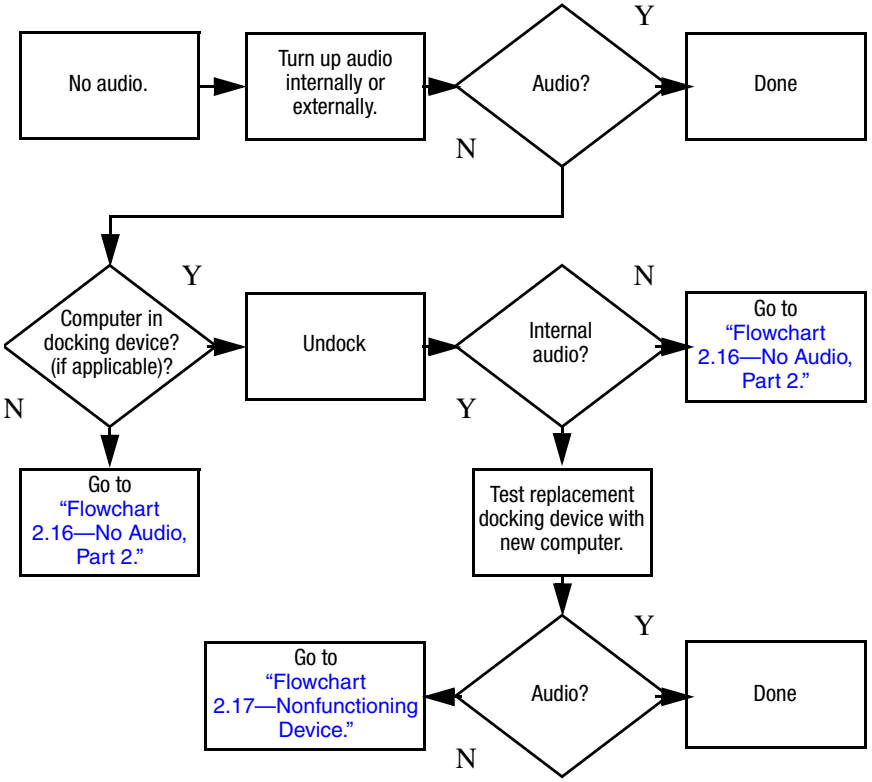
Flowchart 2.13—No OS Loading, Diskette Drive



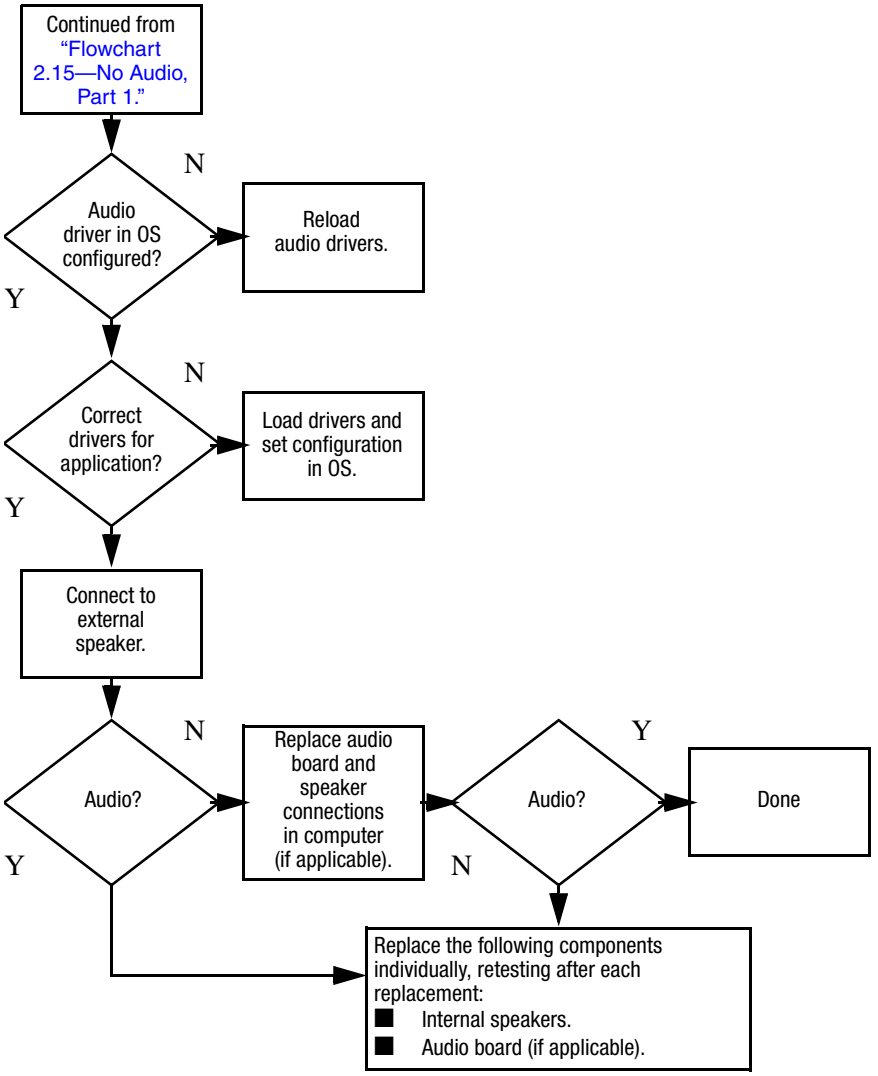
Flowchart 2.14—No OS Loading, Optical Drive



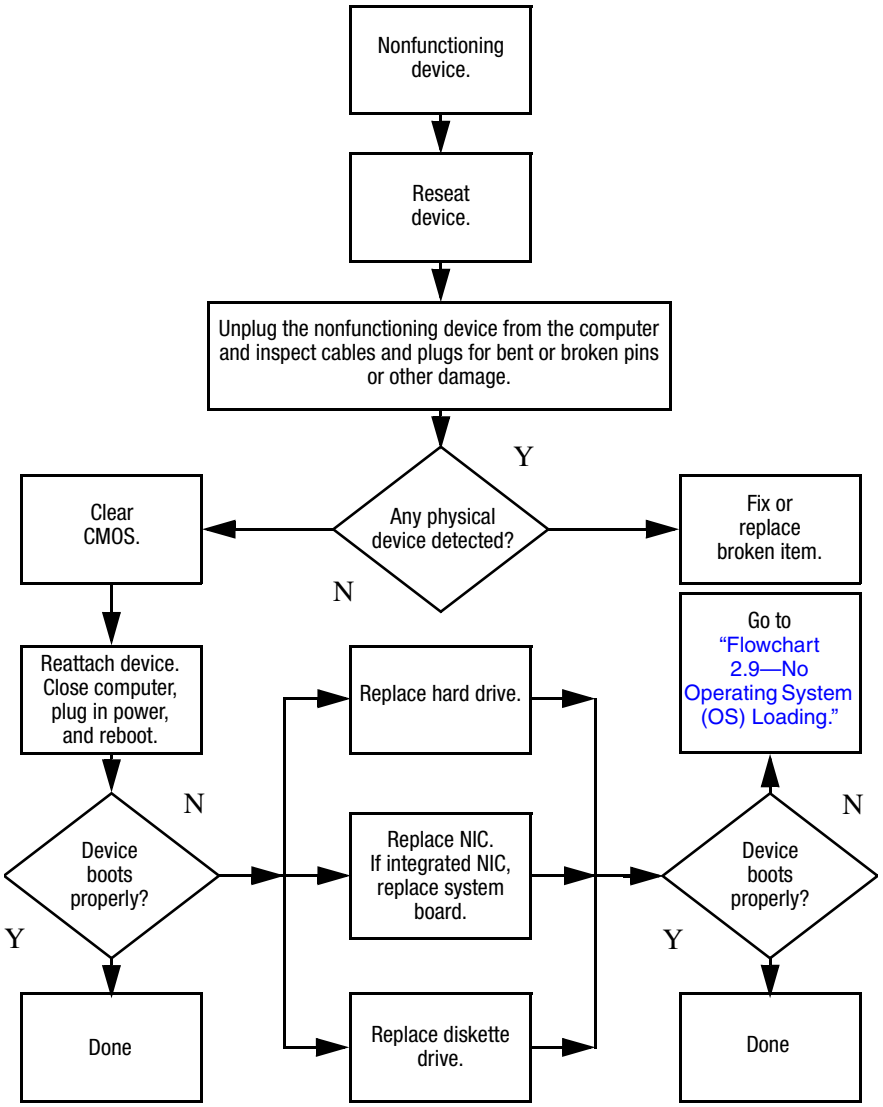
Flowchart 2.15—No Audio, Part 1



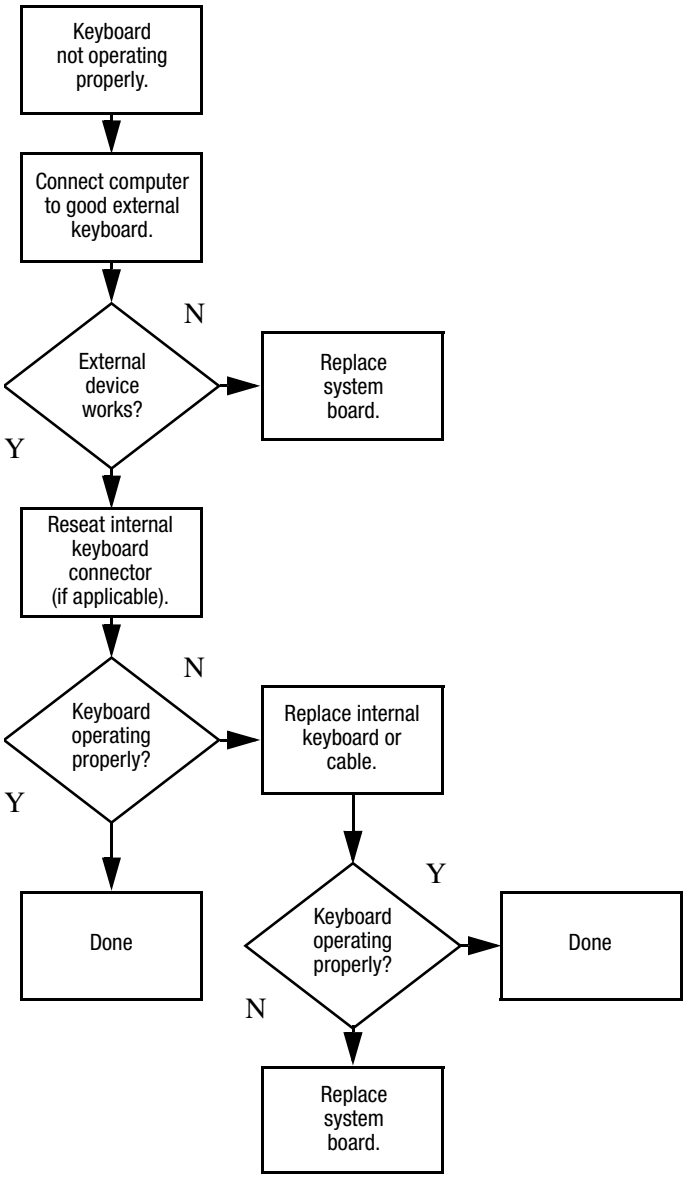
Flowchart 2.16—No Audio, Part 2



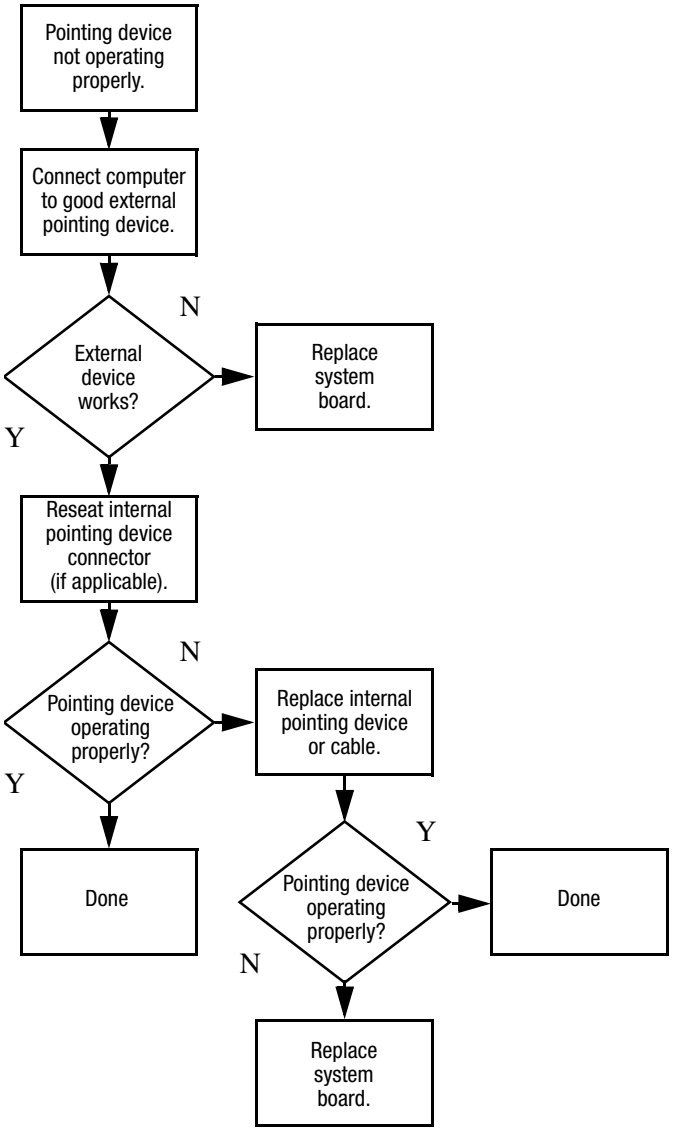
Flowchart 2.17—Nonfunctioning Device



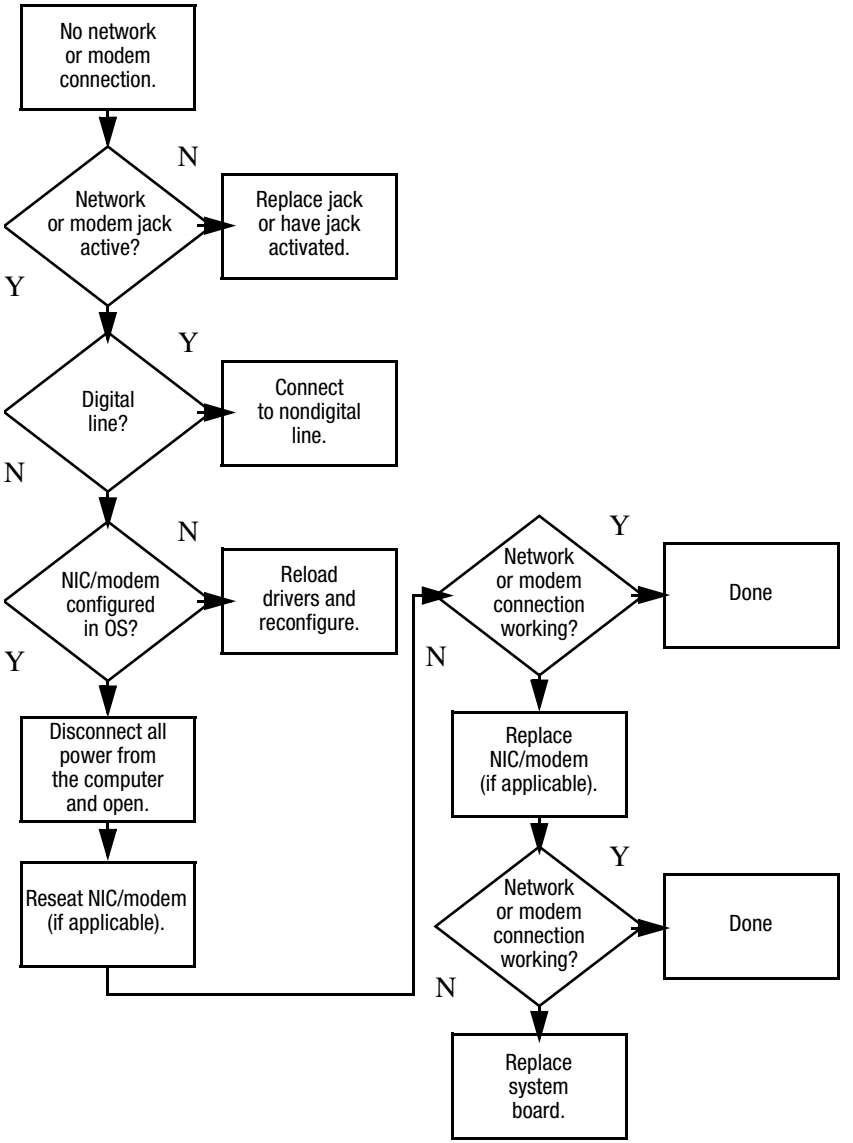
Flowchart 2.18—Nonfunctioning Keyboard



Flowchart 2.19—Nonfunctioning Pointing Device



Flowchart 2.20—No Network/Modem Connection



3

Illustrated Parts Catalog

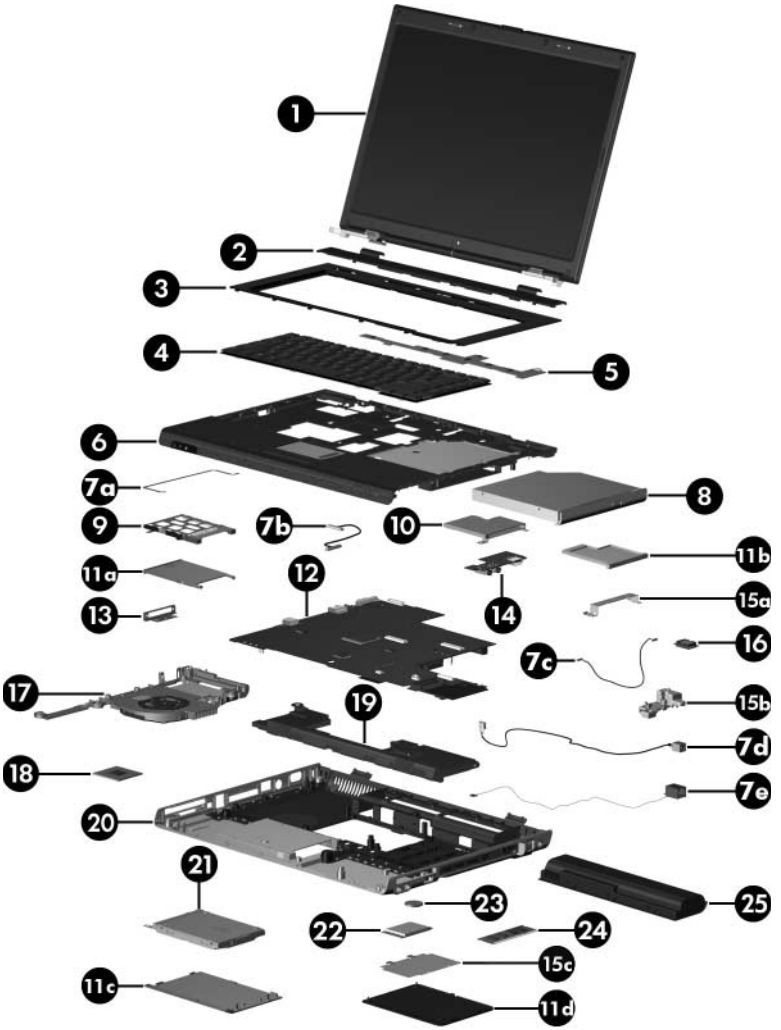
This chapter provides an illustrated parts breakdown and a reference for spare part numbers.

3.1 Serial Number Location

When ordering parts or requesting information, provide the computer serial number and model number located on the bottom of the computer.

Serial Number Location

3.2 Computer Major Components

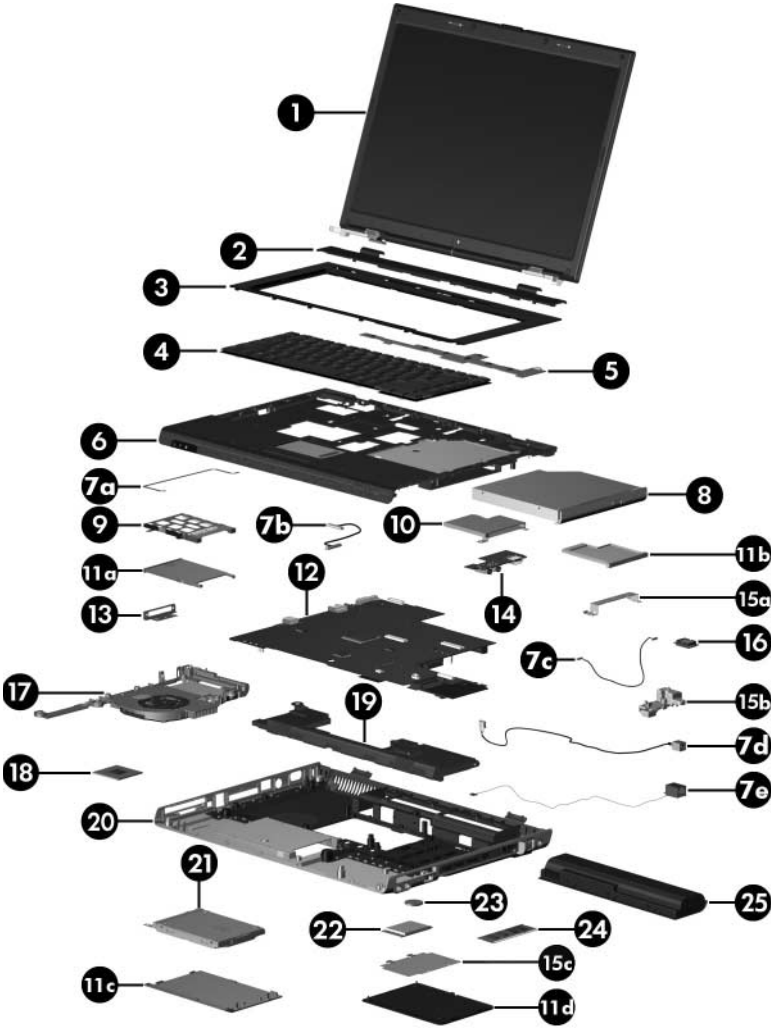


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components

Item	Description	Spare Part Number
1	**Display assemblies** (include display cable, wireless antenna boards, and antenna cables)	
	15.4-inch, WXGA with BrightView	407841-001
	15.4-inch, WXGA antiglare	407839-001
	✎ Refer to Section 3.3, "Display Assembly Subcomponents," for display assembly internal component spare part number information.	
2	**Switch cover**	407825-001
3	**Keyboard frame**	407786-001
4	**Keyboards**	
	Belgium 407857-A41	Portugal 407857-131
	Denmark 407857-081	Spain 407857-071
	France 407857-051	Saudi Arabia 407587-171
	French Canada 407857-121	Sweden/Finland 407587-B71
	Germany 407857-041	Switzerland 407857-111
	Greece 407857-151	Taiwan 407857-AB1
	International 407857-B31	Thailand 407857-281
	Israel 407857-BB1	Turkey 407857-141
	Italy 407857-061	The United Kingdom 407857-031
	Korea 407857-AD1	
	Norway 407857-091	The United States 407857-001
5	**LED board** (includes LED board cable)	409069-001

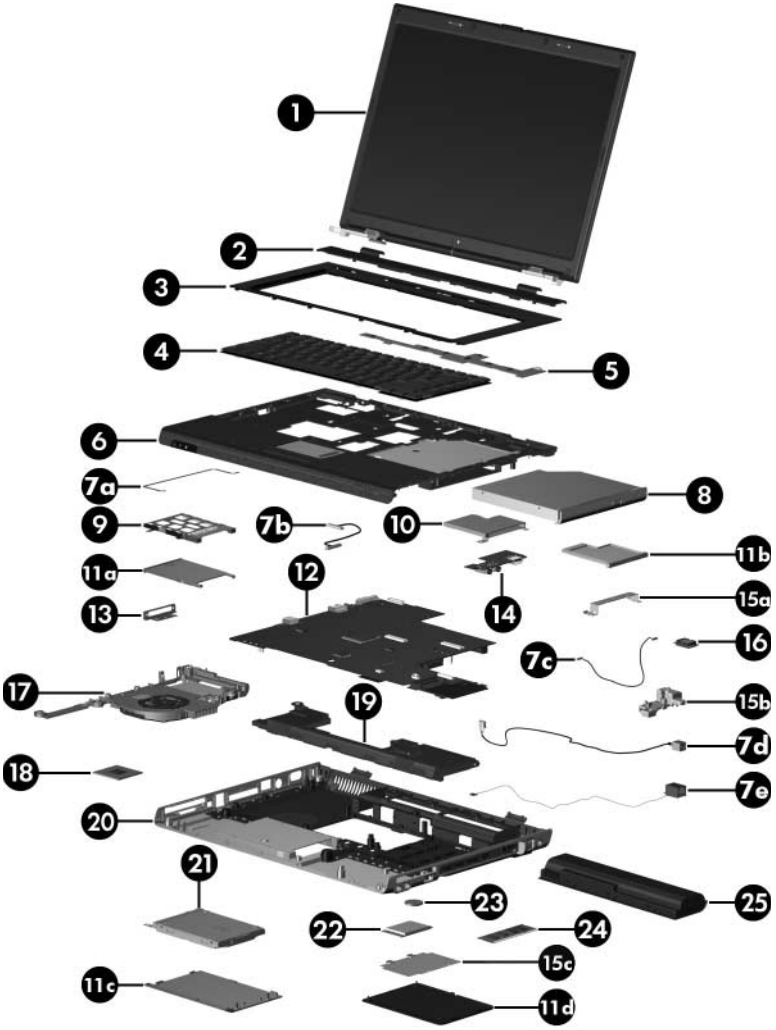


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description	Spare Part Number
6	**Top cover** (includes TouchPad)	407822-001
	TouchPad bracket (not illustrated)	407811-001
	Cable Kit	407774-001
	Includes:	
7a	TouchPad cable	
7b	USB/audio board cable	
7c	Bluetooth module cable	
7d	Power connector and cable	
7e	Modem connector and cable	
8	**Optical drives**	
	DVD±RW and CD-RW Double Layer Combo Drive with LightScribe and HLDS	417698-001
	DVD±RW and CD-RW Double Layer Combo Drive with LightScribe	403806-001
	DVD/CD-RW Double Layer Combo Drive with LightScribe	407855-001
	DVD/CD-RW Combo Drive	407854-001
9	**PC Card assembly**	407829-001
10	**ExpressCard assembly**	407809-001
	Plastics Kit	407778-001
	Includes:	
11a	PC Card slot bezel	
11b	ExpressCard slot bezel	
11c	Hard drive cover (includes 2 captive screws)	
11d	Memory/Mini Card module compartment cover (includes 2 captive screws)	
	Computer feet (8, not illustrated)	

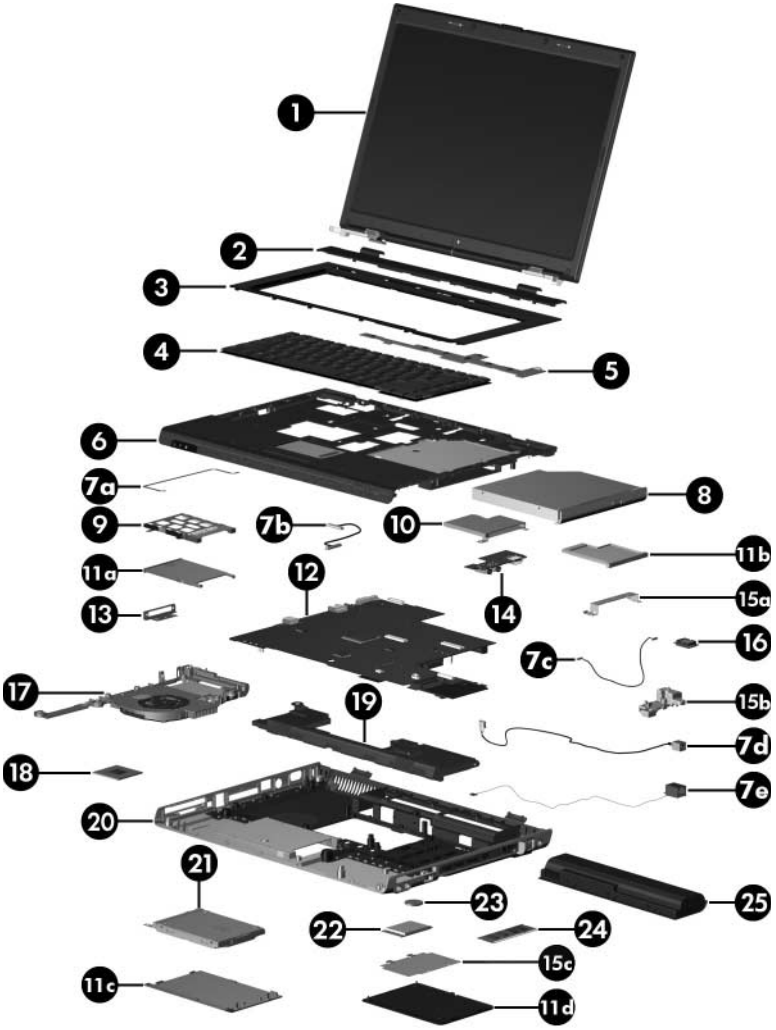


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description	Spare Part Number
12	**945PM NV72 system board**	407758-001
13	**Expansion port 2 bracket**	407863-001
14	**USB/audio board** (includes USB/audio board cable)	409076-001
	Bracket Kit	407820-001
	Includes:	
15a	ExpressCard bracket	
15b	Display hinge support bracket	
15c	Memory shield	
16	**Bluetooth® module** (includes Bluetooth module cable)	397922-001
17	**Fan assembly discrete** (includes thermal paste)	407862-001
	Fan assembly UMA (includes thermal paste)	413453-001
	Heat sink assembly (includes thermal paste)	403827-001
	Thermal module	407862-001
18	**Processors** (include thermal paste)	
	Intel Pentium M 2.0-GHz	407762-001
	Intel Pentium M 1.83-GHz	407761-001
	Intel Pentium M 1.66-GHz Dual Code	407760-001
	Intel Pentium M 1.66-GHz Single Code	407764-001

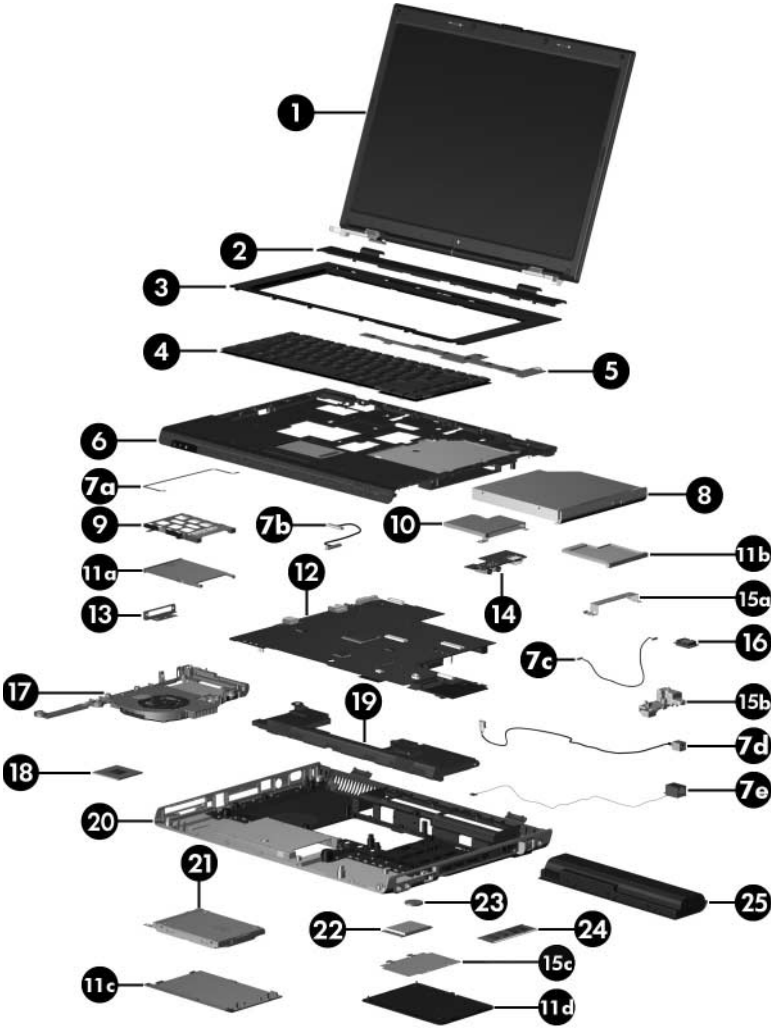


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description	Spare Part Number
19	**Speakers**	407784-001
20	**Base enclosure**	413451-001
21	**Hard drives** (include frame and connector)	
	5400 rpm, 100-GB	407770-001
	5400 rpm, 80-GB	407847-001
	5400 rpm, 60-GB	407769-001
	5400 rpm, 40-GB	407768-001
22	**Mini Card modules**	
	802.11a/b/g Mini Card WLAN module for use in the countries listed below. These countries are categorized as most of the world (MOW) 1.	407576-001
	Antigua & Barbuda Argentina Australia Bahamas Barbados Brunei Canada Chile Dominican Republic Guam Guatemala Hong Kong Panama India Indonesia Malaysia Mexico New Zealand Paraguay Saudi Arabia Taiwan The United States Vietnam	

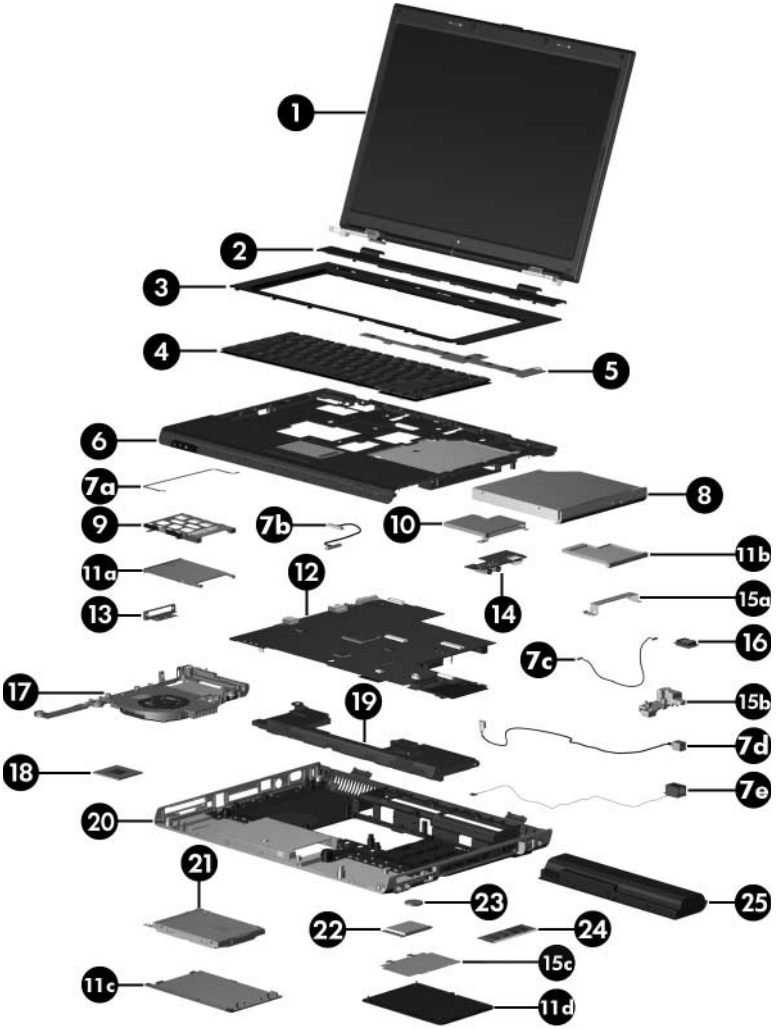


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description	Spare Part Number
22	**Mini Card modules** *(Continued)*	
	802.11a/b/g Mini Card WLAN module for use in the countries listed below. These countries are categorized as MOW 2.	407576-002
	Aruba Austria Azerbaijan Bahrain Belgium Bermuda Bulgaria Cayman Islands Columbia Croatia Cyprus Czech Republic Denmark Egypt El Salvador Estonia Finland France Georgia Germany Greece Hungary Iceland Ireland Italy Latvia Lebanon Philippines Poland Portugal Romania Russia Serbia and Montenegro Singapore Slovakia Liechtenstein Lithuania Luxembourg Malta Monaco The Netherlands Norway Oman Slovenia South Africa Spain Sri Lanka Sweden Switzerland Turkey The United Kingdom Uzbekistan	



Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description				Spare Part Number
22	**Mini Card modules** *(Continued)*				
	802.11a/b/g Mini Card WLAN module for use in the countries listed below. These countries are categorized as the rest of the world (ROW).				407576-003
	China Ecuador Haiti	Honduras Pakistan Peru	Qatar South Korea	Uruguay Venezuela	
	802.11b/g WLAN module for use in the following countries:				409250-004
	Jordan Israel	Kuwait Thailand	United Arab Emirates	Ukraine	
23	**RTC battery** (includes 2-sided tape)				407816-001
24	**Memory modules**, 1-DIMM				
	PC2-5300		PC2-4200		
	1024 MB	409060-001	1024 MB		407767-001
	512 MB	409059-001	512 MB		407766-001
	256 MB	409058-001	256 MB		407765-001
	SD Memory Cards (not illustrated)				
	512 MB				407316-001
	256 MB				403573-001
25	**Battery packs**				
	12-cell, 8.8-Amp hour				407835-001
	6-cell, 4.0-Amp hour				407834-001

3.3 Display Assembly Subcomponents

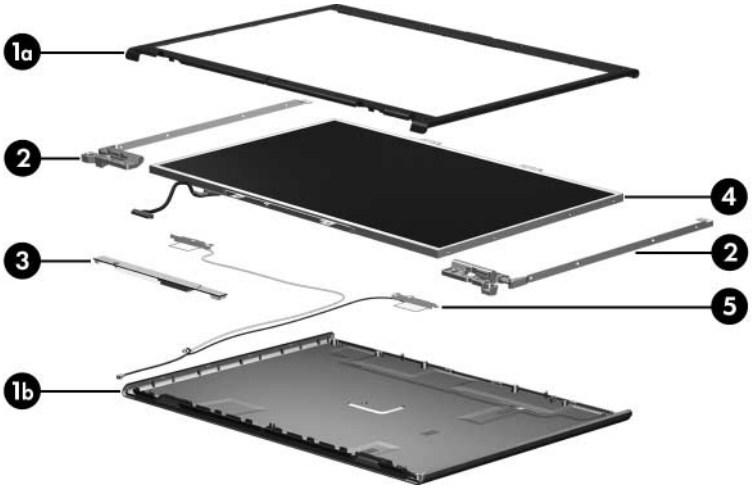


Table 3-2

Display Assembly Subcomponents

Spare Part Number Information

Item	Description	
	Display Plastics Kit, includes:	407792-001
1a	■ Display bezel	
1b	■ Display enclosure	
	■ Display release latch actuator and hooks (not illustrated)	
2	**Display Hinge Kit**	407796-001
3	**Display inverter board**	407800-001
4	**Display Panel Kit** (includes display panel cable)	
	15.4-inch, WXGA with BrightView	407799-001
	15.4-inch, WXGA antiglare	407798-001
5	**Wireless Antenna Kit** (includes cable, transceivers, and tape)	407791-001
	Display Label Kit (not illustrated)	409081-001
	Display Screw Kit (not illustrated), includes:	407794-001
	■ Phillips PM2.5×7.0 screws	
	■ Phillips PM2.0×4.0 screws	
	■ Rubber screw covers	

3.4 Plastics Kit

Table 3-3

Plastics Kit

Spare Part Number Information

Item	Description	Spare Part Number
	Plastics Kit, includes:	407778-001
1	Memory/Mini Card module compartment cover (includes 2 captive screws, secured by C-clips)	
2	Hard drive cover (includes 2 captive screws, secured by C-clips)	
3	Computer feet for use on base enclosure (6)	
4	Computer feet for use on 12-cell battery pack	
5	ExpressCard slot bezel	
6	PC Card slot bezel	

3.5 Cable Kit

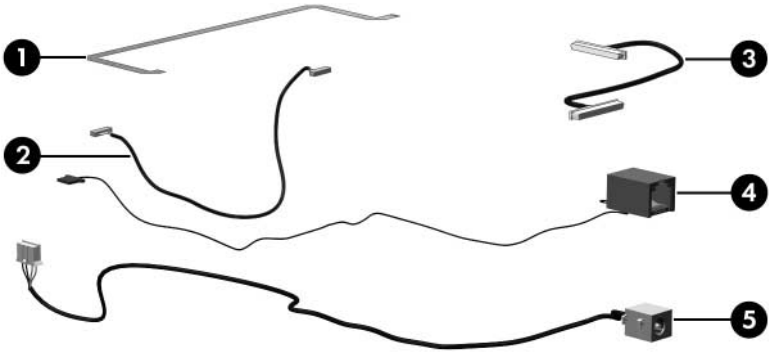


Table 3-4

Cable Kit

Spare Part Number Information

Item	Description	Spare Part Number
	Cable Kit, includes:	407774-001
1	TouchPad cable	
2	Bluetooth module cable	
3	USB/audio board cable	
4	Modem connector cable	
5	Power connector cable	

3.6 Mass Storage Devices

Table 3-5

Mass Storage Devices

Spare Part Number Information

Item	Description	Spare Part Number
1	**Hard drives** (include frame and connector)	
	5400 rpm, 100-GB	407770-001
	5400 rpm, 80-GB	407847-001
	5400 rpm, 60-GB	407769-001
	5400 rpm, 40-GB	407768-001
2	**Optical drives**	
	DVD±RW and CD-RW Double Layer Combo Drive with LightScribe and HLDS	417698-001
	DVD±RW and CD-RW Double Layer Combo Drive with LightScribe	403806-001
	DVD/CD-RW Double Layer Combo Drive with LightScribe	407855-001
	DVD/CD-RW Combo Drive	407854-001
	USB digital drive (not illustrated)	364727-001

3.7 Miscellaneous (Not Illustrated)

Table 3-6

Miscellaneous (Not Illustrated)

Spare Part Information

Description	Spare Part Number
Analog TV tuner	407941-001
Composite S-Video and audio cable	407939-001
DVB-T TV tuner	412175-001
DVB-T TV tuner antenna	412176-001
HP Remote Control II	407313-001
RF cable	408485-001
RF input adapter cable	407940-001
TV tuner remote control	408479-001
USB infrared receiver	408843-001
Screw Kit (includes the following screws; refer to Appendix C, "Screw Listing," for more information on specifications and usage) ■ Phillips PM3.0×6.0 Screw ■ Phillips PM3.0×3.0 screw ■ Phillips PM2.5×11.0 screw ■ Phillips PM2.5×7.0 Screw ■ Phillips PM2.5×6.0 screw ■ Black Phillips PM2.5×5.0 screw ■ Silver Phillips PM2.5×5.0 Screw ■ Phillips PM2.5×3.0 screw ■ Phillips PM2.0×6.0 Screw ■ Phillips PM2.0×4.0 Screw ■ Phillips PM2.0×3.0 Screw ■ Slotted SM1.5×9.0 screw	409067-001
USB travel mouse	309674-001
USB digital drive	364727-001
Wired headset with volume control	371693-001

Table 3-6

Miscellaneous (Not Illustrated)

Spare Part Information *(Continued)*

Description	Spare Part Number
Power supply, 65 watt	403810-001
Power cords	
For use in:	
Australia	403811-011
Canada, French Canada, and the United States	403811-001
Denmark	403811-081
France, Germany, and Spain	403811-021
India	403811-D61
Israel	403811-BB1
Italy	403811-061
Korea	403811-AD1
The People's Republic of China	403811-AA1
Switzerland	403811-111
Taiwan	403811-AB1
The United Kingdom	403811-031

3.8 Sequential Part Number Listing

Table 3-7

Sequential Part Number Listing

Spare Part Number	Description
309674-001	USB travel mouse
364727-001	USB digital drive
371693-001	Wired headset with volume control
397922-001	Bluetooth module (includes Bluetooth module cable)
403573-001	SD Memory Card 256-MB
403806-001	DVD±RW and CD-RW Double Layer Combo Drive with LightScribe
403810-001	Power supply, 65 watt
403811-001	Power cord for use in The United States
403811-011	Power cord for use in Australia
403811-021	Power cord for use internationally
403811-031	Power cord for use in the United Kingdom
403811-061	Power cord for use in Italy
403811-081	Power cord for use in Denmark
403811-111	Power cord for use in Sweden and Finland
403811-AA1	Power cord for use in the People's Republic of China
403811-AB1	Power cord for use in Taiwan
403811-AD1	Power cord for use in Korea
403811-BB1	Power cord for use in Israel
403811-D61	Power cord for use in India
403827-001	Heat sink (includes thermal paste)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
407313-001	HP Remote Control II
407316-001	SD Memory Card 512-MB
407576-001	802.11a/b/g Mini Card WLAN module for use in the following MOW 1 countries: Antigua & Barbuda Argentina Australia Bahamas Barbados Brunei Canada Chile Dominican Republic Guam Guatemala Hong Kong Panama India Indonesia Malaysia Mexico New Zealand Paraguay Saudi Arabia Taiwan The United States Vietnam
407576-002	802.11a/b/g Mini Card WLAN module for use in the following MOW 2 countries: Aruba Austria Azerbaijan Bahrain Belgium Bermuda Bulgaria Cayman Islands Columbia Croatia Cyprus Czech Republic Denmark Egypt El Salvador Estonia Finland France Georgia Germany Greece Hungary Iceland Ireland Italy Latvia Lebanon Philippines Poland Portugal Romania Russia Serbia and Montenegro Singapore Slovakia Liechtenstein Lithuania Luxembourg Malta Monaco The Netherlands Norway Oman Slovenia South Africa Spain Sri Lanka Sweden Switzerland Turkey The United Kingdom Uzbekistan

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
407576-003	802.11a/b/g Mini Card WLAN module for use in the following ROW countries: China, Ecuador, Haiti, Honduras, Pakistan, Peru, Qatar, South Korea, Uruguay, Venezuela
407758-001	945PM NV72 system board
407760-001	Intel Pentium M 1.66-GHz Dual Code processor (include thermal paste)
407761-001	Intel Pentium M 1.83-GHz processor (include thermal paste)
407762-001	Intel Pentium M 2.0-GHz processor (include thermal paste)
407764-001	Intel Pentium M 1.66-GHz Single Code processor (include thermal paste)
407765-001	1-DIMM, PC2-4200 256 MB memory module
407766-001	1-DIMM, PC2-4200 512 MB memory module
407767-001	1-DIMM, PC2-4200 1024 MB memory module
407768-001	5400 rpm, 40-GB hard drive (include frame and connector)
407769-001	5400 rpm, 60-GB hard drive (include frame and connector)
407770-001	5400 rpm, 100-GB hard drive (include frame and connector)
407774-001	Cable Kit
407778-001	Plastics Kit
407780-001	Rubber Pad Kit
407784-001	Speakers
407786-001	Keyboard frame
407791-001	Wireless antenna transceivers and cables (includes tape)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
407792-001	Display Plastics Kit
407794-001	Display Screw Kit
407796-001	Display HInge Kit
407798-001	Display panel kit for use with antiglare displays
407799-001	Display panel kit for use with BrightView displays
407800-001	Display inverter board
407809-001	ExpressCard assembly
407811-001	TouchPad bracket
407816-001	RTC battery (includes 2-sided tape)
407820-001	Bracket Kit
407822-001	Top cover (includes TouchPad)
407825-001	Switch cover
407829-001	PC Card assembly
407834-001	6-cell, 4.0-Amp hour battery pack
407835-001	12-cell, 8.8-Amp hour battery pack
407839-001	15.4-inch, WXGA antiglare display assembly (includes display cable, wireless antenna boards, and antenna cables)
407841-001	15.4-inch, WXGA with BrightView display assembly (includes display cable, wireless antenna boards, and antenna cables)
407847-001	5400 rpm, 80-GB hard drive (includes frame and connector)
407854-001	DVD/CD-RW Combo Drive
407855-001	DVD/CD-RW Double Layer Combo Drive with LightScribe
407857-001	Keyboard for use in the United States

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
407857-031	Keyboard for use in The United Kingdom
407857-041	Keyboard for use in Germany
407857-051	Keyboard for use in France
407857-061	Keyboard for use in Italy
407857-071	Keyboard for use in Spain
407857-081	Keyboard for use in Denmark
407857-091	Keyboard for use in Norway
407857-111	Keyboard for use in Switzerland
407857-121	Keyboard for use in French Canada
407857-131	Keyboard for use in Portugal
407857-141	Keyboard for use in Turkey
407857-151	Keyboard for use in Greece
407857-171	Keyboard for use in Saudi Arabia
407857-281	Keyboard for use in Thailand
407857-A41	Keyboard for use in Belgium
407857-AB1	Keyboard for use in Taiwan
407857-AD1	Keyboard for use in Korea
407857-B31	Keyboard for use internationally
407857-B71	Keyboard for use in Sweden and Finland
407857-BB1	Keyboard for use in Israel
407862-001	Thermal module

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
407863-001	Expansion port 2 bracket
407868-001	945GM system board
407939-001	Composite S-Video and audio cable
407940-001	RF input adapter cable
407941-001	Analog TV tuner
408479-001	TV tuner remote control
408485-001	RF cable
408843-001	USB infrared receiver
409058-001	1-DIMM, PC2-5300 256 MB memory module
409059-001	1-DIMM, PC2-5300 512 MB memory module
409060-001	1-DIMM, PC2-5300 1024 MB memory module
409067-001	Screw Kit
409069-001	LED board (includes LED board cable)
409076-001	USB/audio board (includes USB/audio board cable)
409081-001	Display Label Kit
409250-004	802.11b/g Mini Card WLAN module for use in the following countries: Jordan, Kuwait, United Arab Emirates, Ukraine Israel, Thailand

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
412175-001	DVB-T TV tuner
412176-001	DVB-T TV tuner antenna
413451-001	Base enclosure
413453-001	Fan assembly UMA (includes thermal paste)
417698-001	DVD±RW and CD-RW Double Layer Combo Drive with LightScribe and HLDS
418409-001	Fan assembly discrete (includes thermal paste)

4

Removal and Replacement Preliminaries

This chapter provides essential information for proper and safe removal and replacement service.

4.1 Tools Required

You will need the following tools to complete the removal and replacement procedures:

- Magnetic screwdriver
- Phillips P0 screwdriver
- Flat-bladed screwdriver
- Tool kit—includes connector removal tool, loopback plugs, and case utility tool

4.2 Service Considerations

The following sections include some of the considerations that you should keep in mind during disassembly and assembly procedures.

As you remove each subassembly from the computer, place the subassembly (and all accompanying screws) away from the work area to prevent damage.

Plastic Parts

Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.

Cables and Connectors

CAUTION: When servicing the computer, ensure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.

Cables must be handled with extreme care to avoid damage. Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Ensure that cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced. Handle flex cables with extreme care; these cables tear easily.

4.3 Preventing Damage to Removable Drives

Removable drives are fragile components that must be handled with care. To prevent damage to the computer, damage to a removable drive, or loss of information, observe the following precautions:

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in hibernation, turn the computer on, and then shut it down through the operating system.
- Before removing a diskette drive or optical drive, ensure that a diskette or disc is not in the drive and ensure that the optical drive tray is closed.
- Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- Handle drives on surfaces covered with at least one inch ofghshock-proof foam.
- Avoid dropping drives from any height onto any surface.
- After removing a hard drive, an optical drive, or a diskette drive, place it in a static-proof bag.
- Avoid exposing a hard drive to products that have magnetic fields, such as monitors or speakers.
- Avoid exposing a drive to temperature extremes or liquids.
- If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package “FRAGILE: Handle With Care.”

4.4 Preventing Electrostatic Damage

Many electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.

A sudden discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs.

An electronic device exposed to electrostatic discharge may not be affected at all and can work perfectly throughout a normal cycle. Or the device may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

4.5 Packaging and Transporting Precautions

Use the following grounding precautions when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe containers, such as tubes, bags, or boxes.
- Protect all electrostatic-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a sensitive component or assembly.
- Store reusable electrostatic-sensitive parts from assemblies in protective packaging or nonconductive foam.
- Use transporters and conveyors made of antistatic belts and roller bushings. Ensure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

4.6 Workstation Precautions

Use the following grounding precautions at workstations:

- Cover the workstation with approved static-shielding material (refer to Table 4-2, "Static-Shielding Materials").
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools such as cutters, screwdrivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials such as ordinary plastic assembly aids and Styrofoam.
- Handle electrostatic-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

4.7 Grounding Equipment and Methods

Grounding equipment must include either a wrist strap or a foot strap at a grounded workstation.

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm ±10% resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

Other grounding equipment recommended for use in preventing electrostatic damage includes:

- Antistatic tape
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of one megohm resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

Table 4-1 shows how humidity affects the electrostatic voltage levels generated by different activities.

Table 4-1

Typical Electrostatic Voltage Levels

	Relative Humidity		
Event	**10%**	**40%**	**55%**
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tube	2,000 V	700 V	400 V
Removing DIPS from vinyl tray	11,500 V	4,000 V	2,000 V
Removing DIPS from Styrofoam	14,500 V	5,000 V	3,500 V
Removing bubble pack from PCB	26,500 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V

✎ A product can be degraded by as little as 700 V.

Table 4-2 lists the shielding protection provided by antistatic bags and floor mats.

Table 4-2

Static-Shielding Materials

Material	Use	Voltage Protection Level
Antistatic plastic	Bags	1,500 V
Carbon-loaded plastic	Floor mats	7,500 V
Metallized laminate	Floor mats	5,000 V

5

Removal and Replacement Procedures

This chapter provides removal and replacement procedures.

There are as many as 98 screws, in 12 different sizes, that may have to be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Refer to Appendix C, "Screw Listing," for detailed information on screw sizes, locations, and usage.

5.1 Serial Number

Report the computer serial number to HP when requesting information or ordering spare parts. The serial number is located on the bottom of the computer.

Serial Number Location

5.2 Disassembly Sequence Chart

Use the chart below to determine the section number to be referenced when removing computer components.

Disassembly Sequence Chart

Section	Description	# of Screws Removed
5.3	Preparing the Computer for Disassembly	
	Battery pack	0
5.4	Hard Drive	2 loosened to remove the hard drive cover 2 to remove the hard drive 4 to disassemble the hard drive
5.5	Computer Feet	0
5.6	Memory Module	2 loosened to remove the memory/Mini Card module compartment cover
5.7	Mini Card Module	0
	⚠ To prevent an unresponsive system and the display of a warning message, install only a Mini Card device authorized for use in your computer by the governmental agency that regulates wireless devices in your country. If you install a device and then receive a warning message, remove the device to restore computer functionality. Then contact Customer Care.	
5.8	RTC Battery	0

Disassembly Sequence Chart *(Continued)*

Section	Description	# of Screws Removed
5.9	Optical Drive	1 to remove to optical drive 2 to remove the optical drive bracket
5.10	Switch Cover	7
5.11	Keyboard Frame	1
5.12	LED Board	5
5.13	Keyboard	4
5.14	Display Assembly	4 to remove the display assembly 8 to remove the display bezel 2 to remove the display panel 4 to remove each display hinge 1 to remove each wireless antenna transceiver
5.15	Top Cover	21
5.16	Bluetooth Module	1
5.17	System Board	6
5.18	USB/Audio Board	1
5.19	Fan/Heat Sink Assembly	9
5.20	Processor	1 loosened
5.21	Speakers	1
5.22	PC Card Assembly	2
5.23	ExpressCard Assembly	2

5.3 Preparing the Computer for Disassembly

Before you begin any removal or installation procedures:

1. Shut down the computer. If you are unsure whether the computer is off or in hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.

Battery Pack Spare Part Number Information	
12-cell, 8.8-Amp hour	407835-001
6-cell, 4.0-Amp hour	407834-001

4. Remove the battery pack by following these steps:
   a. Turn the computer upside down with the front toward you.

b. Slide the battery pack release latch ❶ to the left. (The battery pack disengages from the computer.)

c. Lift the front edge of the battery pack ❷ and swing it back to remove it.

Removing the Battery Pack

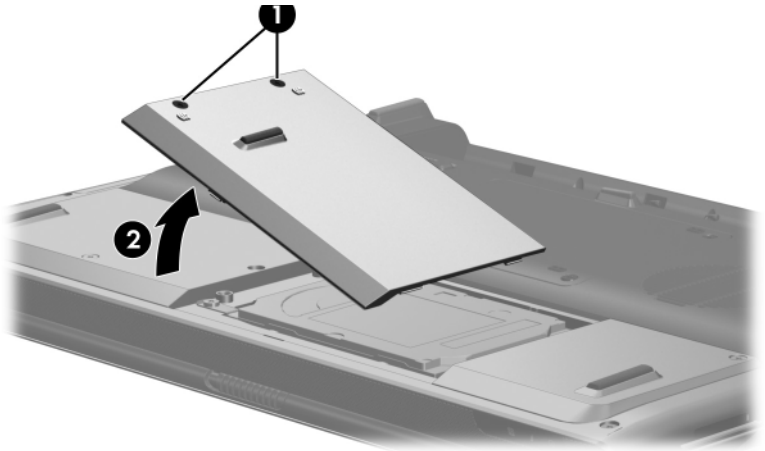
Reverse the above procedure to install the battery pack.

5.4 Hard Drive

Hard Drive Spare Part Number Information	
5400 rpm, 100-GB	407770-001
5400 rpm, 80-GB	407847-001
5400 rpm, 60-GB	407769-001
5400 rpm, 40-GB	407768-001

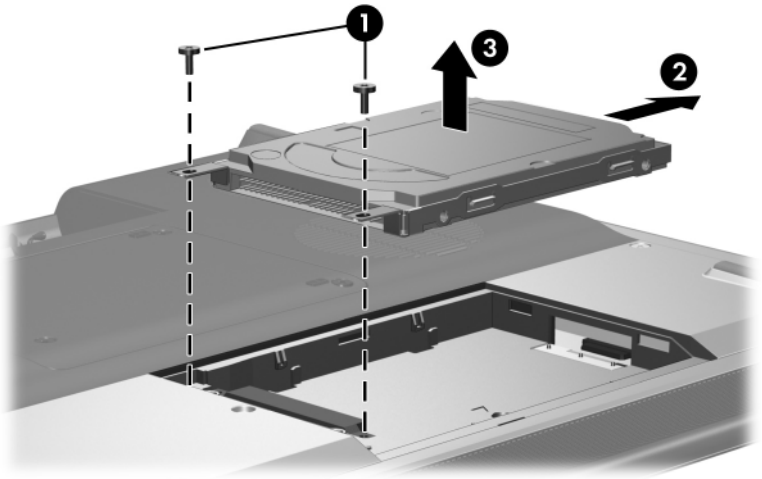
1. Prepare the computer for disassembly (refer to Section 5.3).
2. Loosen the two black Phillips PM2.5×5.0 screws ❶ that secure the hard drive cover to the computer.
3. Lift the left edge of the hard drive cover ❷ and swing it up and to the right and remove it.

The hard drive cover is included in the Plastics Kit, spare part number 407778-001.



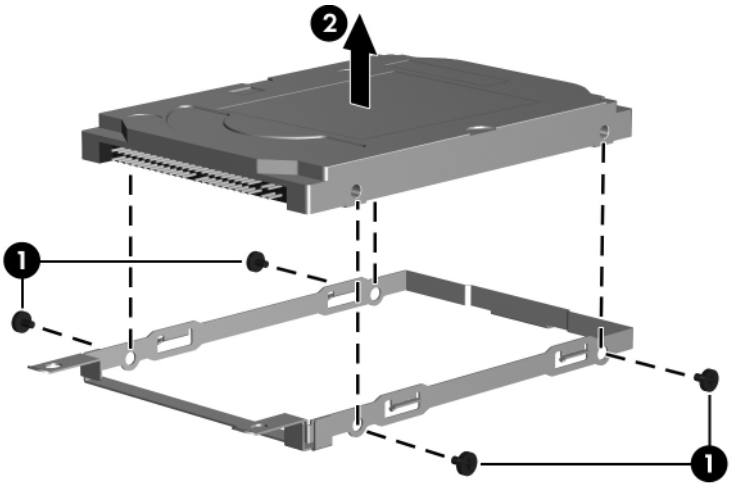
Removing the Hard Drive Cover

4. Remove the two Phillips PM2.5×6.0 hard drive retention screws ❶ that secure the hard drive to the computer.
5. Slide the hard drive ❷ to the right to disconnect if from the system board.
6. Remove the hard drive ❸ from the hard drive bay.



Removing the Hard Drive

7. Remove the four Phillips PM3.0×3.0 hard drive frame screws ❶ that secure the hard drive frame to the hard drive.
8. Lift the hard drive ❷ straight up and remove the hard drive frame.



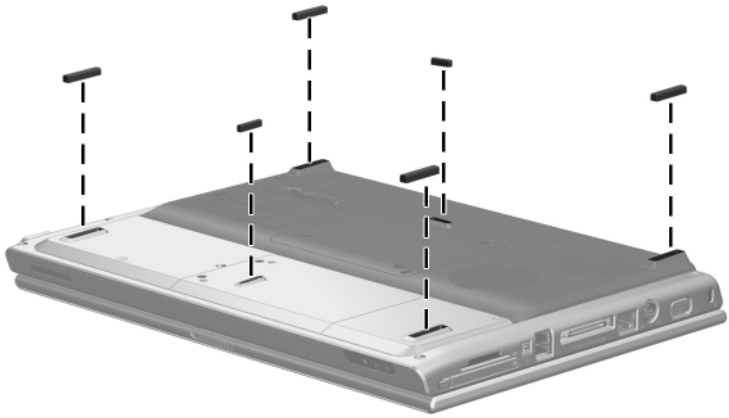
Removing the Hard Drive Frame

Reverse the above procedure to reassemble and install the hard drive.

5.5 Computer Feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Plastics Kit, spare part number 407778-001.

There are two additional computer feet that are installed on the 12-cell battery pack. These additional feet are not shown in the following image.



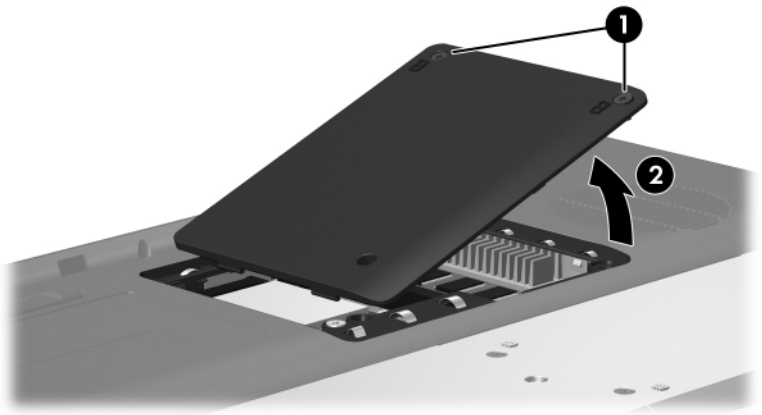
Replacing the Computer Feet

5.6 Memory Module

Memory Module Spare Part Number Information			
1 DIMM, PC2-5300		1 DIMM, PC2-4200	
1024 MB	409060-001	1024 MB	407767-001
512 MB	409059-001	512 MB	407766-001
256 MB	409058-001	256 MB	407765-001

1. Prepare the computer for disassembly (refer to Section 5.3).
2. Loosen the two black Phillips PM2.5×5.0 screws ❶ that secure the memory/Mini Card module compartment cover to the computer.
3. Lift the right side of the cover ❷ and swing it up and to the left and remove it.

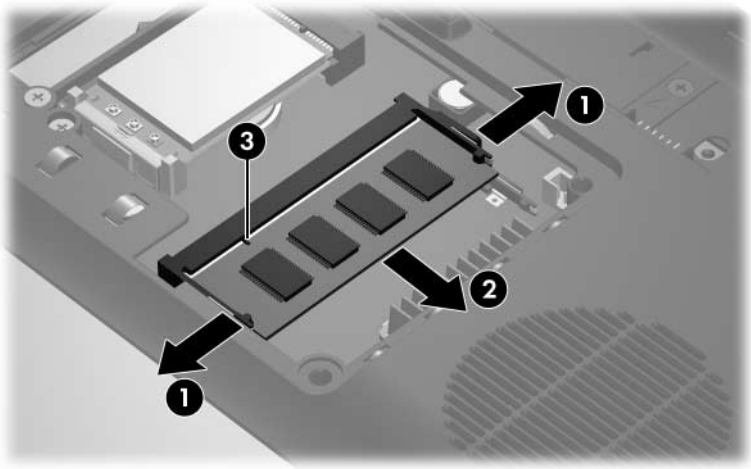
The memory/Mini Card module compartment cover is included in the Plastics Kit, spare part number 407778-001.



Removing the Memory/Mini Card Module Compartment Cover

4. Spread the retaining tabs ❶ on each side of the memory module socket to release the memory module. (The edge of the module opposite the socket rises away from the computer.)
5. Remove the memory module by pulling the module away from the socket at an angle ❷.

Memory modules are designed with a notch ❸ to prevent incorrect installation into the memory module socket.



Removing the Memory Module

Reverse the above procedure to install a memory module.

5.7 Mini Card Module

Mini Card Module Spare Part Number Information			
802.11a/b/g WLAN module for use in the MOW 1 category countries listed below.			407576-001
Antigua & Barbuda Argentina Australia Bahamas Barbados Brunei Canada	Chile Dominican Republic Guam Guatemala Hong Kong	Panama India Indonesia Malaysia Mexico New Zealand	Paraguay Saudi Arabia Taiwan The United States Vietnam
802.11a/b/g WLAN module for use in the MOW 2 category countries listed below.			407576-002
Aruba Austria Azerbaijan Bahrain Belgium Bermuda Bulgaria Cayman Islands Columbia Croatia Cyprus Czech Republic Denmark Egypt	El Salvador Estonia Finland France Georgia Germany Greece Hungary Iceland Ireland Italy Latvia Lebanon	Philippines Poland Portugal Romania Russia Serbia and Montenegro Singapore Slovakia Liechtenstein Lithuania Luxembourg Malta Monaco	The Netherlands Norway Oman Slovenia South Africa Spain Sri Lanka Sweden Switzerland Turkey The United Kingdom Uzbekistan

Mini Card Module

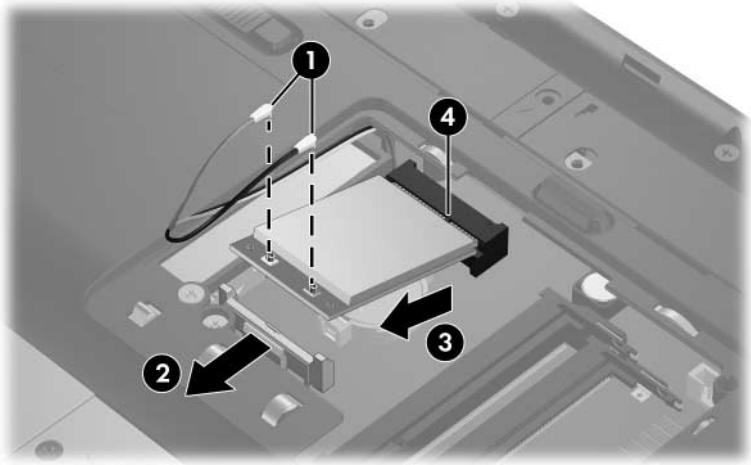
Spare Part Number Information *(Continued)*

802.11a/b/g Mini Card WLAN module for use in the ROW category countries listed below.			407576-003
China	Honduras	Qatar	Uruguay
Ecuador	Pakistan	South Korea	Venezuela
Haiti	Peru		
802.11b/g Mini Card WLAN module for use in the following countries:			409250-004
Israel	Kuwait	United Arab Emirates	Ukraine
Jordan	Thailand		

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the memory/Mini Card module compartment cover (Section 5.6).

3. Make note of which wireless antenna cable is attached to which terminal on the Mini Card module, then disconnect the auxiliary and main antenna cables ❶ from the Mini Card module.
4. Flex the Mini Card release tab ❷ forward to release the Mini Card module. (The edge of the module opposite the socket rises away from the computer.)
5. Remove the Mini Card module by pulling the module away from the socket at an angle ❸.

Mini Card modules are designed with a notch ❹ to prevent incorrect installation into the Mini Card module socket.



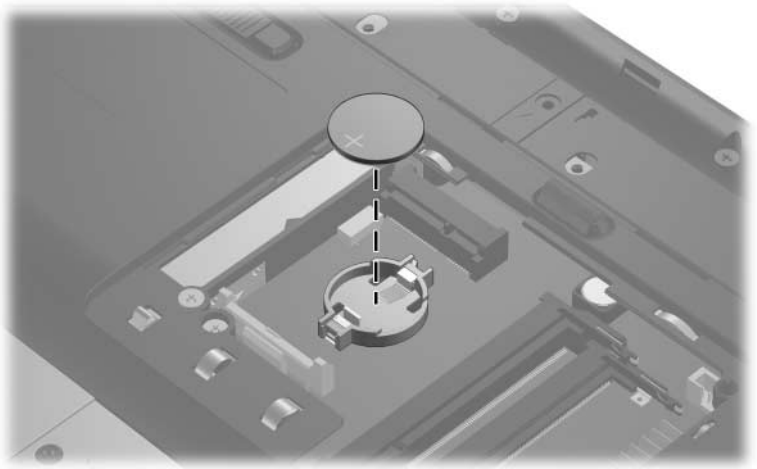
Removing a Mini Card Module

Reverse the above procedure to install a Mini Card module.

5.8 RTC Battery

RTC Battery Spare Part Number Information	
RTC battery (includes 2-sided tape)	407816-001

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the memory/Mini Card module compartment cover (Section 5.6).
3. Remove the Mini Card module (Section 5.7).
4. Remove the RTC battery from the socket on the system board.



Removing the RTC Battery

Reverse the above procedure to install an RTC battery.

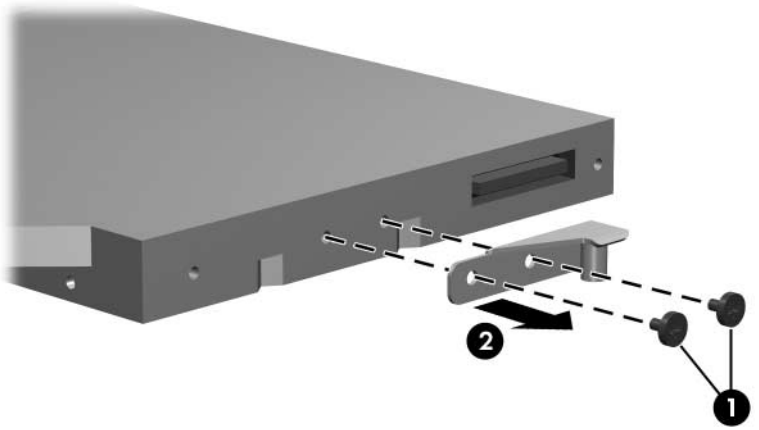
5.9 Optical Drive

Optical Drive Spare Part Number Information	
DVD±RW and CD-RW Double Layer Combo Drive with LightScribe and HLDS	417698-001
DVD±RW and CD-RW Double Layer Combo Drive with LightScribe	403806-001
DVD/CD-RW Double Layer Combo Drive with LightScribe	407855-001
DVD/CD-RW Combo Drive	407854-001

1. Prepare the computer for disassembly (Section 5.3).
2. Position the computer with the left side toward you.
3. Remove the Phillips PM2.5×11.0 screw ❶ that secures the optical drive to the computer.
4. Push the rear edge of the optical drive ❷ to disconnect the drive from the system board.
5. Remove the optical drive ❸.

Removing the Optical Drive

6. If it is necessary to replace the optical drive bracket, remove the two Phillips PM2.0×4.0 screws ❶ that secure the bracket to the optical drive.
7. Remove the optical drive bracket ❷.



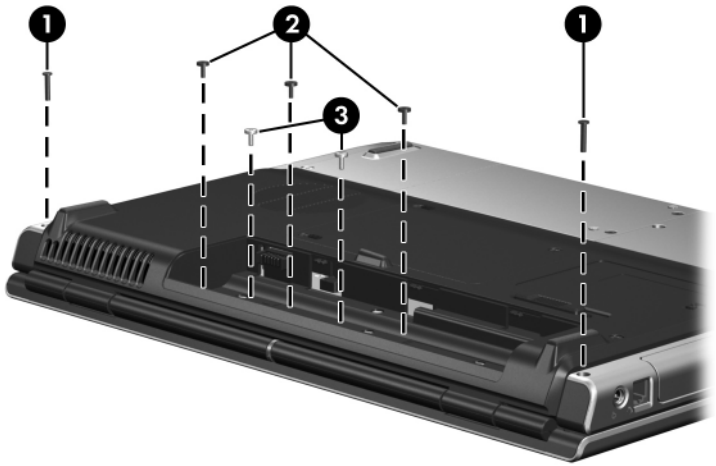
Removing the Optical Drive Bracket

Reverse the above procedure to install an optical drive.

5.10 Switch Cover

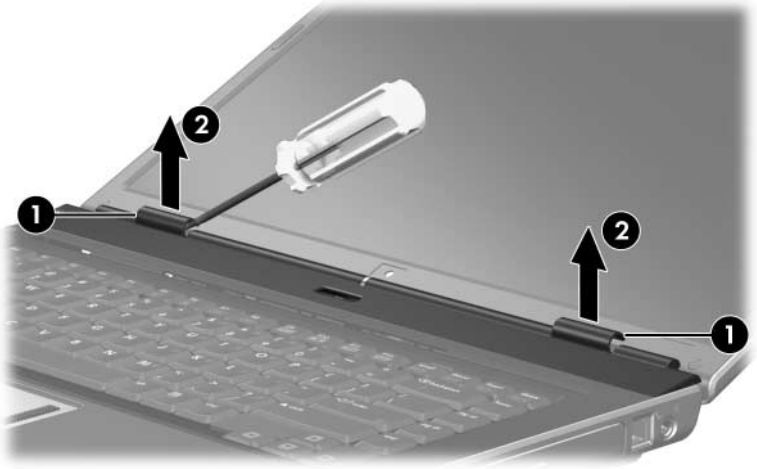
Switch Cover Spare Part Number Information	
Switch cover	407825-001

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the following screws:
   - ❶ Two Phillips PM2.5×11.0 screws
   - ❷ Three Phillips PM2.5×6.0 screws
   - ❸ Two silver Phillips PM2.5×5.0 screws



Removing the Switch Cover Screws

3. Turn the computer display-side up with front toward you.
4. Open the computer as far as possible.
5. Insert a flat-bladed tool under the display hinge cover sections ❶ of the switch cover.
6. Lift the switch cover until the left and right sides ❷ of the switch cover disengage from the computer.
7. Remove the switch cover.



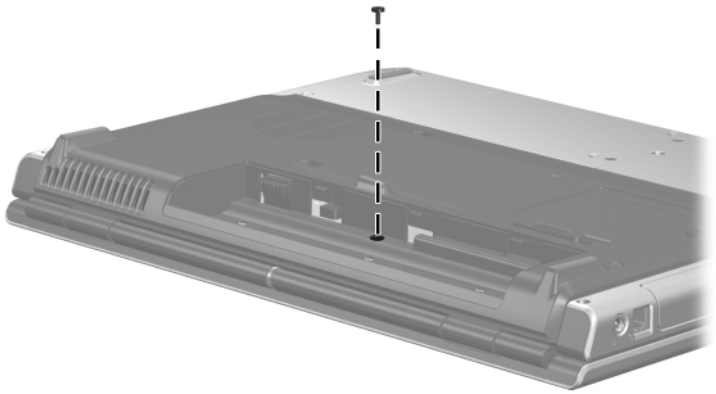
Removing the Switch Cover

Reverse the above procedure to install the switch cover.

5.11 Keyboard Frame

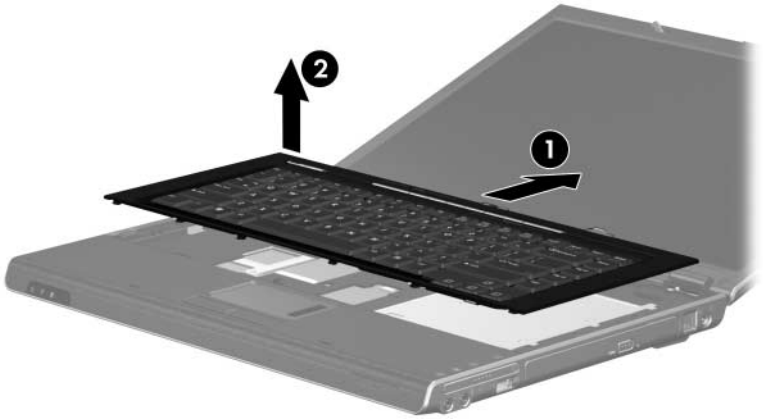
Keyboard Frame Spare Part Number Information	
Keyboard frame	407786-001

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the memory/Mini Card module compartment cover (Section 5.6).
3. Remove the switch cover (Section 5.10).
4. Turn the computer upside down with the rear panel toward you.
5. Remove the Phillips PM2.0×6.0 screw in the battery bay that secures the keyboard frame to the computer.



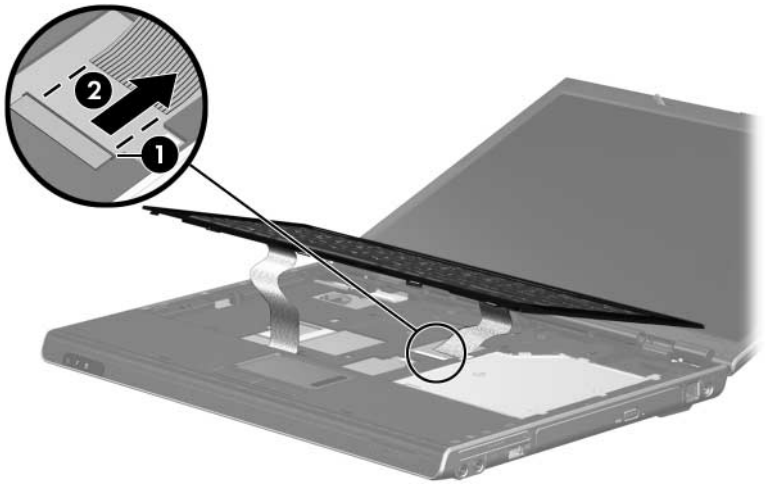
Removing the Keyboard Frame Screw

6. Turn the computer display-side up with front toward you.
7. Open the computer as far as possible.
8. Slide the keyboard frame ❶ toward the back of the computer.
9. Lift and hold the rear edge of the keyboard frame ❷ until the LED board cable connector is accessible.



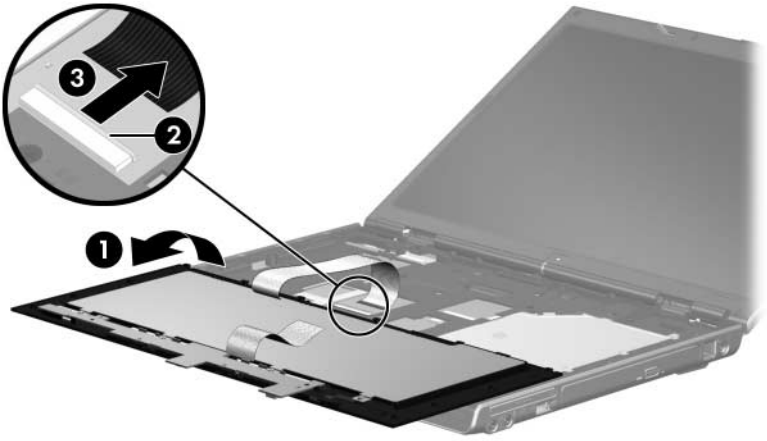
Releasing the Keyboard Frame

10. Release the zero insertion force (ZIF) connector ❶ to which the LED board cable is connected and disconnect the cable ❷.



Disconnecting the LED Board Cable

11. Swing the keyboard frame ❶ up and forward until it rests upside down on the palm rest.
12. Release the ZIF connector to which the keyboard cable ❷ is attached and disconnect the keyboard cable ❸.
13. Remove the keyboard frame.



Removing the Keyboard Frame

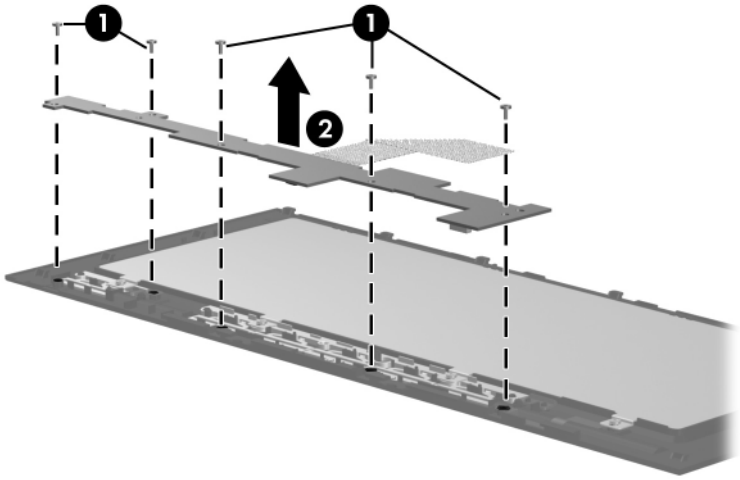
Reverse the above procedure to install the keyboard frame.

5.12 LED Board

LED Board Spare Part Number Information	
The LED board spare part kit includes the LED board cable.	
LED board	409069-001

1. Prepare the computer for disassembly (Section 5.3) and then remove the following components:
   a. Memory/Mini Card module compartment cover (Section 5.6)
   b. Switch cover (Section 5.10)
   c. Keyboard frame (Section 5.11)
2. Turn the keyboard frame upside down with the LED board toward you.

3. Remove the five Phillips PM2.0×4.0 screws ❶ that secure the LED board to the keyboard frame.
4. Remove the LED board ❷.



Removing the LED Board

Reverse the above procedure to install the LED board.

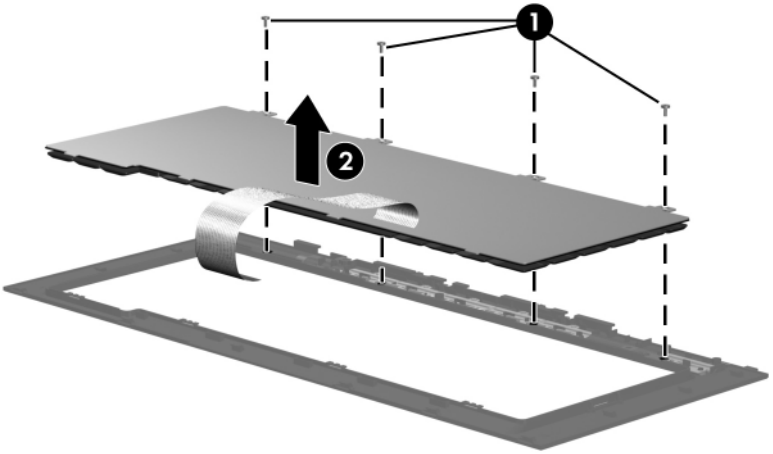
5.13 Keyboard

Keyboard Spare Part Number Information

Belgium	407857-A41	Portugal	407857-131
Denmark	407857-081	Spain	407857-071
France	407857-051	Saudi Arabia	407587-171
French Canada	407857-121	Sweden/Finland	407587-B71
Germany	407857-041	Switzerland	407857-111
Greece	407857-151	Taiwan	407857-AB1
International	407857-B31	Thailand	407857-281
Israel	407857-BB1	Turkey	407857-141
Italy	407857-061	The United Kingdom	407857-031
Korea	407857-AD1	The United States	407857-001
Norway	407857-091		

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the switch cover (Section 5.10).
3. Remove the keyboard frame (Section 5.11).
4. Turn the keyboard assembly upside down with the LED board toward you.

5. Remove the four Phillips PM2.0×3.0 screws ❶ that secure the keyboard to the keyboard frame.
6. Remove the tabs on the bottom of the keyboard from the slots in the keyboard frame.
7. Remove the keyboard ❷.



Removing the Keyboard

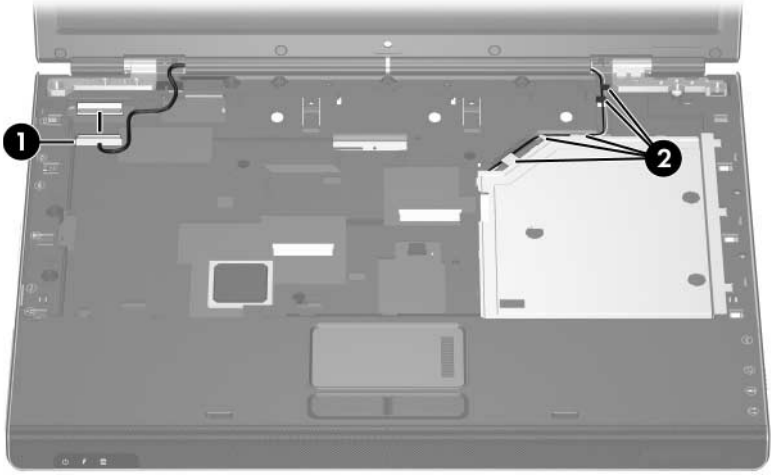
Reverse the above procedure to install the keyboard.

5.14 Display Assembly

Display Assembly Spare Part Number Information	
Display assemblies include display cable, wireless antenna boards, and antenna cables.	
15.4-inch, WXGA with BrightView	407841-001
15.4-inch, WXGA with antiglare	407839-001

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the memory/Mini Card module compartment cover (Section 5.6).
3. Disconnect the wireless antenna cables from the Mini Card module (Section 5.7).
4. Remove the switch cover (Section 5.10).
5. Remove the keyboard frame (Section 5.11).
6. Remove the keyboard (Section 5.13).

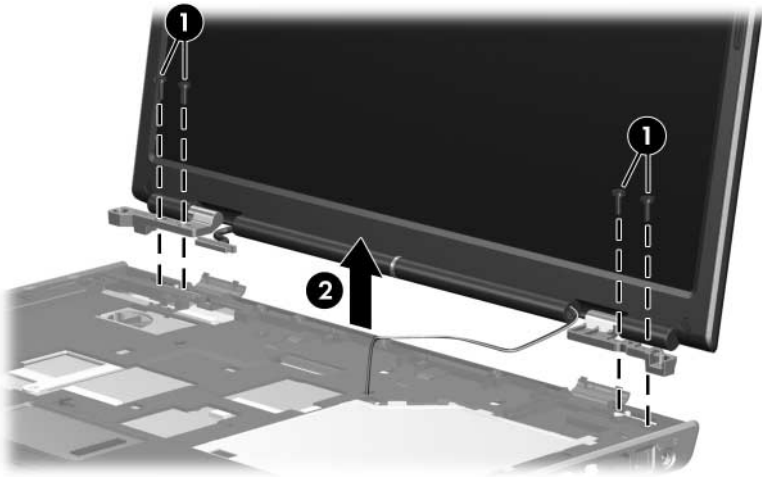
7. Disconnect the display cable ❶ from the system board.
8. Remove the wireless antenna cables from the clips ❷ in the top cover.



Disconnecting the Display and Wireless Antenna Cables

CAUTION: Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

9. Remove the four Phillips PM2.5×7.0 screws ❶ that secure the display assembly to the computer.
10. Lift the display assembly straight up and remove it ❷.



Removing the Display Assembly

Display Assembly Subcomponents

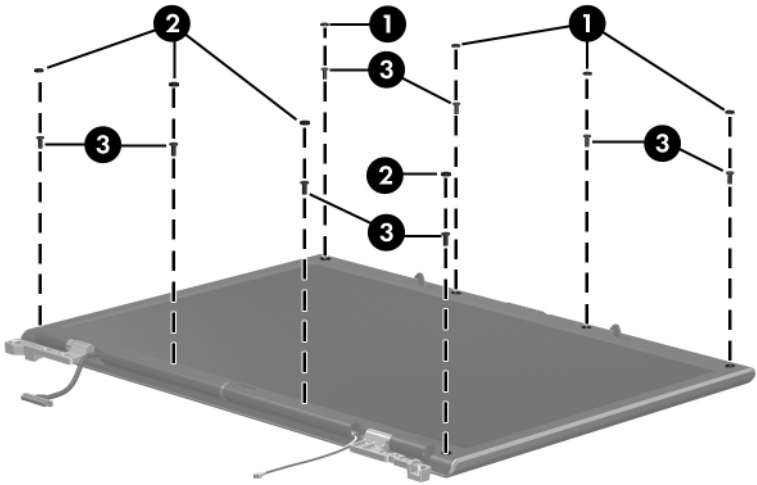
Spare Part Number Information

Display Plastics Kit, includes: ■ Display bezel ■ Display enclosure ■ Display release latch actuator and hooks	407792-001
Display Hinge Kit	407796-001
Display inverter board	407800-001
Display Panel Kit (includes display panel cable) ■ 15.4-inch, WXGA with BrightView ■ 15.4-inch, WXGA antiglare	 407799-001 407798-001
Wireless Antenna Kit (includes cable and transceivers)	407791-001
Display Label Kit (not illustrated)	409081-001
Display Screw Kit (not illustrated), includes: ■ Phillips PM2.5×7.0 screws ■ Phillips PM2.0×4.0 screws ■ Rubber screw covers	407794-001

11. Remove the eight rubber screw covers ❶ and ❷ and the eight Phillips PM2.5×7.0 screws ❸ that secure the display bezel to the display assembly.

The rubber screw covers are included in the Display Screw Kit, spare part number 407794-001.

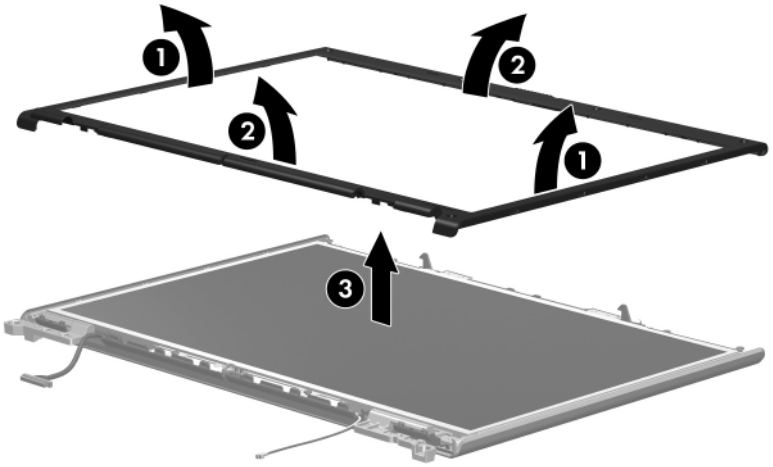
The four rubber screw covers ❶ on the top edge of the display bezel are thicker than the four rubber screw covers ❷ on the bottom edge of the display bezel.



Removing the Display Bezel Screws

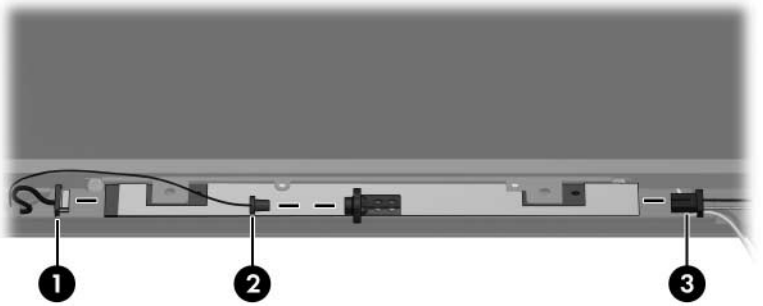
The display bezel and display enclosure are available in the Display Plastics Kit, spare part number 407792-001.

12. Flex the inside edges of the left and right sides ❶ and the top and bottom sides ❷ of the display bezel until the bezel disengages from the display enclosure.
13. Remove the display bezel ❸.



Removing the Display Bezel

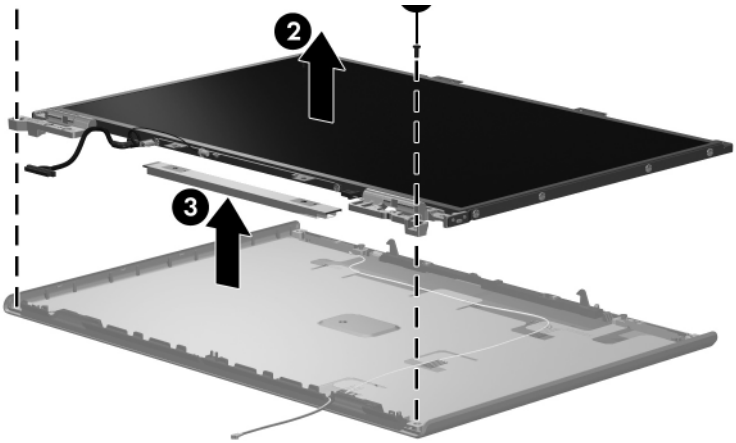
14. Disconnect the following cables:
    - ❶ Display panel cable
    - ❷ Wireless light cable
    - ❸ Display inverter board cable



Disconnecting the Display Panel Cables

Display Assembly Subcomponents Spare Part Number Information	
Display Panel Kit (includes display panel cable)	
■ 15.4-inch, WXGA with BrightView	407799-001
■ 15.4-inch, WXGA antiglare	407798-001
Display inverter board	407800-001

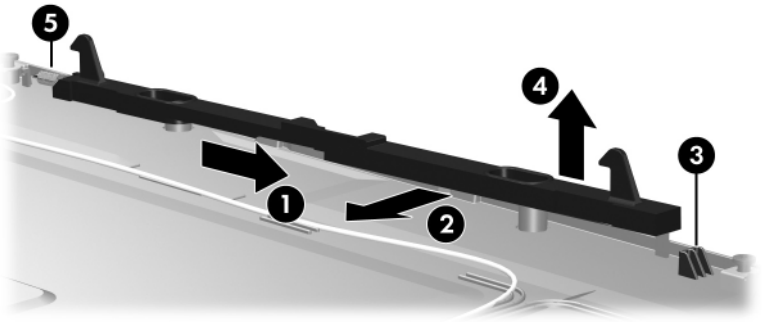
15. Remove the two Phillips PM2.5×7.0 screws ❶ that secure the display panel to the display enclosure.
16. Remove the display panel ❷ and inverter board ❸.



Removing the Display Panel and Inverter Board

The display release hook arm and spring are available in the Display Hinge Kit, spare part number 407796-001.

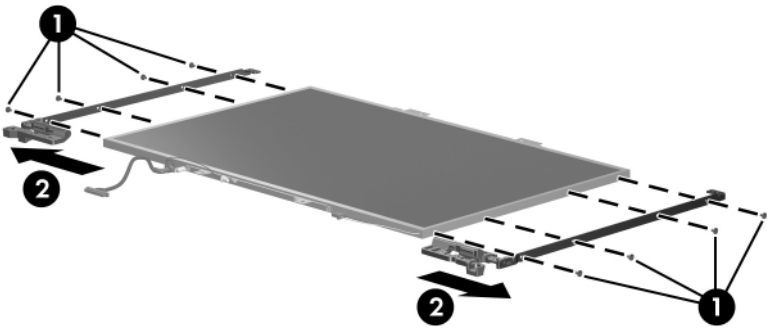
17. If it is necessary to replace the display release hook arm, slide and hold the arm ❶ to the right.
18. Slide the right side of the arm ❷ forward until it clears the tab ❸ on the display enclosure.
19. Lift the arm ❹ out of the display enclosure.
20. Detach the display release hook arm spring ❺ from the tab on the display enclosure.
21. Remove the display release hook arm.



Removing the Display Release Hook Arm

The display hinges are available in the Display Hinge Kit, spare part numbers 407796-001.

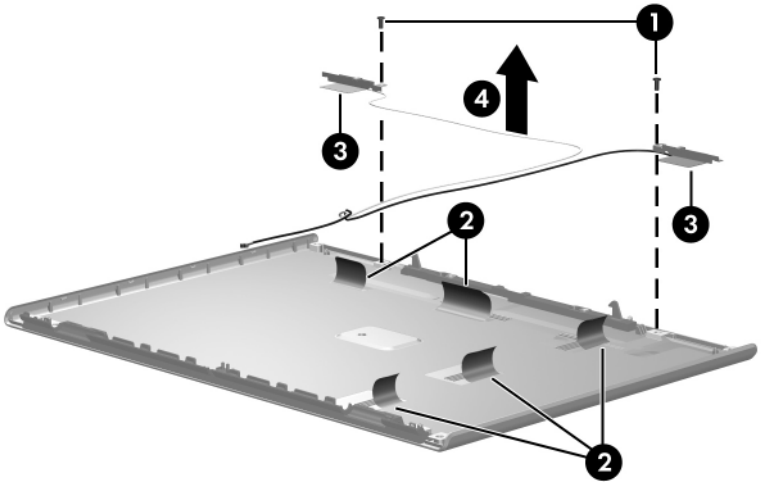
22. If it is necessary to replace the display hinges, remove the four Phillips PM2.0×4.0 screws ❶ that secure each hinge to the display panel.
23. Remove the display hinges ❷.



Removing the Display Hinges

24. Remove the Phillips PM2.0×4.0 screws ❶ that secure the left and right wireless antenna transceivers to the display enclosure.
25. Release the retention tabs ❷ built in to the display enclosure lining that secure the wireless antenna cables to the display enclosure.
26. Detach the wireless antenna transceivers ❸ from the display enclosure.
27. Remove the wireless antenna transceivers and cables ❹.

The wireless antenna transceivers and cables are available in the Wireless Antenna Kit, spare part number 407791-001.



Removing the Wireless Antenna Transceivers and Cables

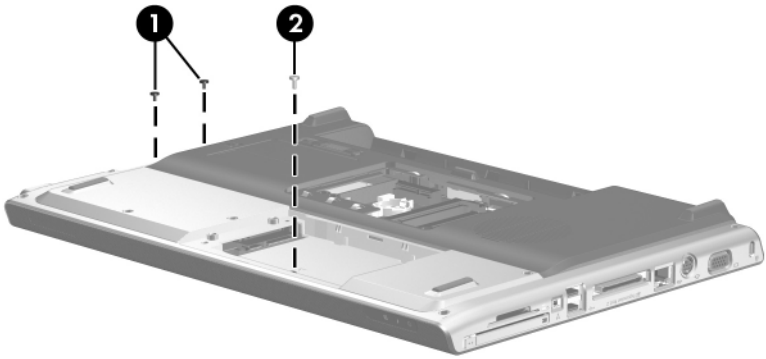
Reverse the above procedure to reassemble and install the display assembly.

5.15 Top Cover

Top Cover Spare Part Number Information	
Top cover (includes TouchPad)	407822-001
TouchPad bracket	407811-001

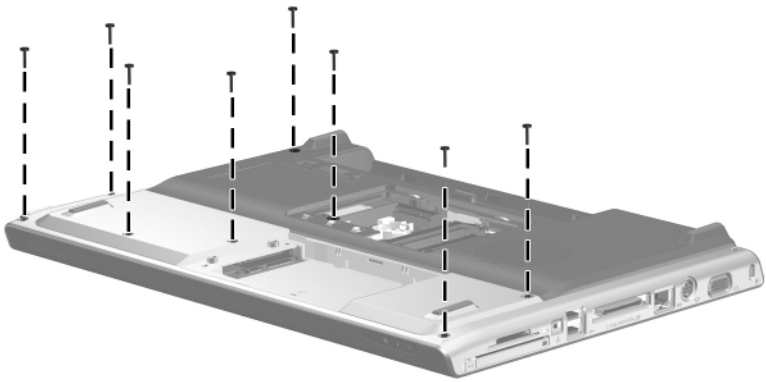
1. Prepare the computer for disassembly (Section 5.3) and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module compartment cover (Section 5.6)
   c. Optical drive (Section 5.9)
   d. Switch cover (Section 5.10)
   e. Keyboard assembly (Section 5.11)
   f. Display assembly (Section 5.14)

2. Turn the computer upside down with the front toward you.
3. Remove the two Phillips PM2.5×3.0 screws ❶ in the optical drive bay and the silver Phillips PM2.5×5.0 screw ❷ in the hard drive bay that secure the top cover to the computer.



Removing the Top Cover Screws, Part 1

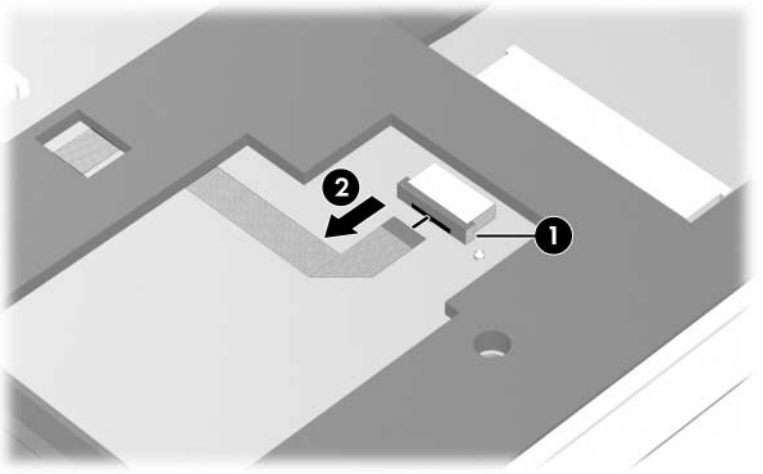
4. Remove the eight Phillips PM2.5×11.0 screws that secure the top cover to the computer.



Removing the Top Cover Screws, Part 2

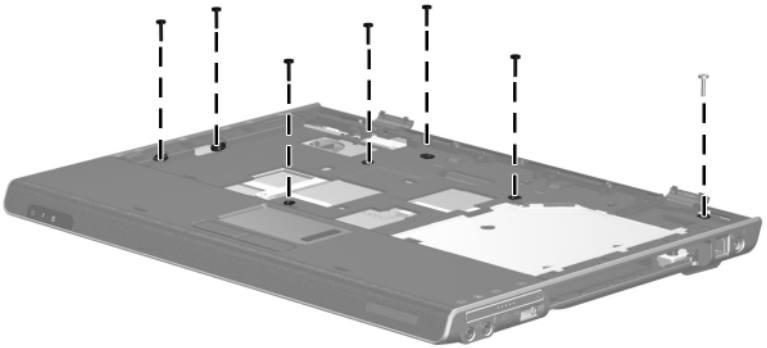
5. Turn the computer right-side up with the front toward you.
6. Release the ZIF connector to which the TouchPad cable ❶ is connected and disconnect the TouchPad cable ❷ from the system board.

The TouchPad cable is included in the Cable Kit, spare part number 407774-001.



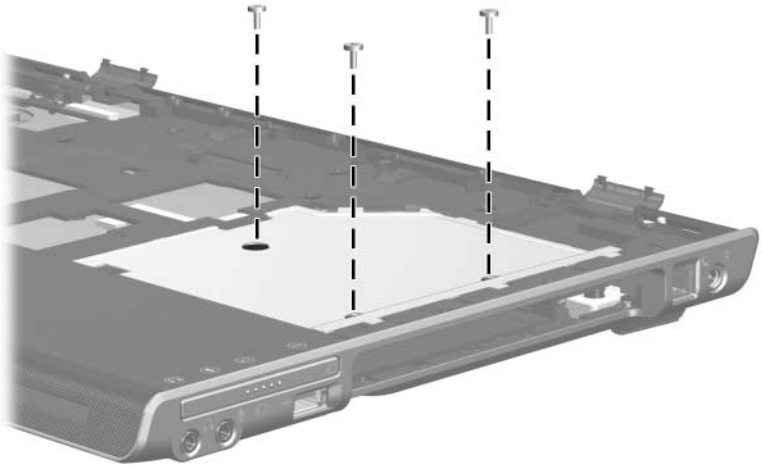
Disconnecting the TouchPad Cable

7. Remove the seven Phillips PM2.5×11.0 screws that secure the top cover to the computer.



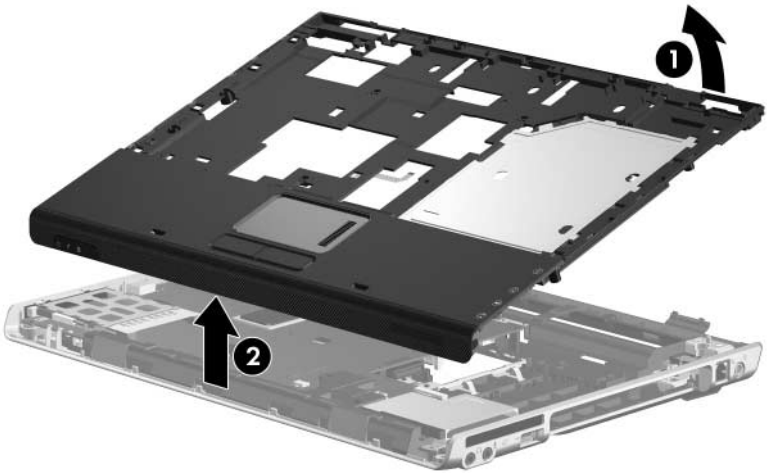
Removing the Top Cover Screws, Part 3

8. Remove the three silver PM2.5×5.0 screws that secure the top cover to the computer.



Removing the Top Cover Screws, Part 4

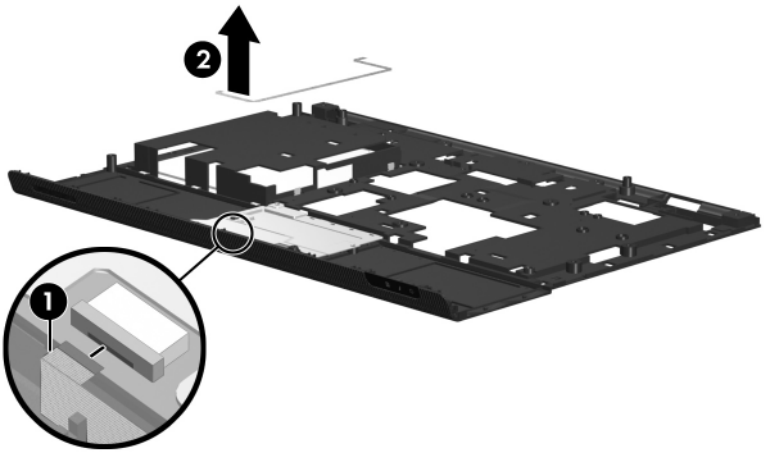
9. Lift up the rear edge of the top cover ❶ until it disengages from the base enclosure.
10. Lift the top cover ❷ straight up and remove it.



Removing the Top Cover

11. If it is necessary to replace the TouchPad cable, release the ZIF connector to which the TouchPad cable ❶ is connected and disconnect the TouchPad cable from the TouchPad board.
12. Remove the TouchPad cable ❷.

The TouchPad cable is included in the Cable Kit, spare part number 407774-001.



Removing the TouchPad Cable

Reverse the above procedure to install the top cover.

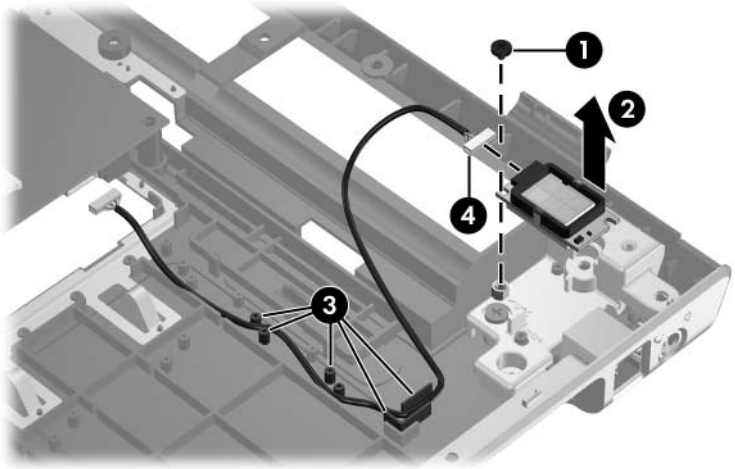
5.16 Bluetooth Module

Bluetooth Module Spare Part Number Information	
Bluetooth module (includes Bluetooth module cable)	397922-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module compartment cover (Section 5.6)
   c. Optical drive (Section 5.9)
   d. Switch cover (Section 5.10)
   e. Keyboard assembly (Section 5.11)
   f. Display assembly (Section 5.14)
   g. Top cover (Section 5.15)

2. Remove the Phillips PM2.0×4.0 screw ❶ that secures the Bluetooth module to the base enclosure.
3. Remove the Bluetooth module from the base enclosure ❷.
4. Remove the Bluetooth module cable ❸ from the routing channel in the base enclosure.
5. Disconnect the Bluetooth module cable ❹ from the Bluetooth board.

The Bluetooth module cable is included with the Bluetooth module and is also available in the Cable Kit, spare part number 407774-001.



Removing the Bluetooth Board

Reverse the above procedure to install the Bluetooth board.

5.17 System Board

System Board Spare Part Number Information	
945PM NV72 system board	407758-001

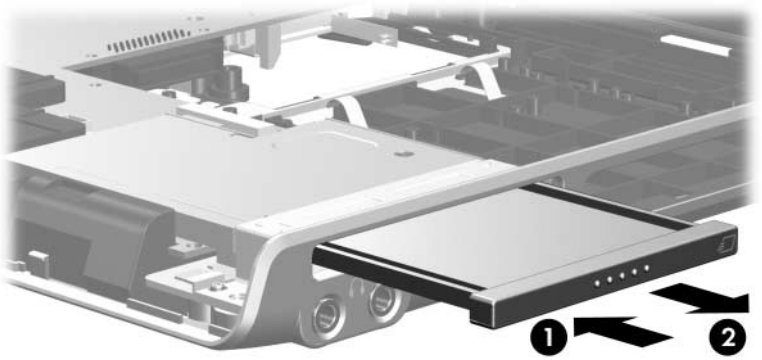
When replacing the system board, ensure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory modules (Section 5.6)
- Mini Card module (Section 5.7)
- RTC battery (Section 5.8)
- Power connector and cable (Section 5.17)
- Fan/heat sink assembly(Section 5.19)
- Processor (Section 5.20)
- PC Card assembly (Section 5.22)
- ExpressCard assembly (Section 5.22)

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Optical drive (Section 5.9)
   c. Switch cover (Section 5.10)
   d. Keyboard assembly (Section 5.11)
   e. Display assembly (Section 5.14)
   f. Top cover (Section 5.15)
   g. Bluetooth board (Section 5.16)

2. Turn the computer right-side up with the front toward you.
3. Press in on the ExpressCard slot bezel ❶ to release it.
4. Remove the ExpressCard slot bezel ❷.

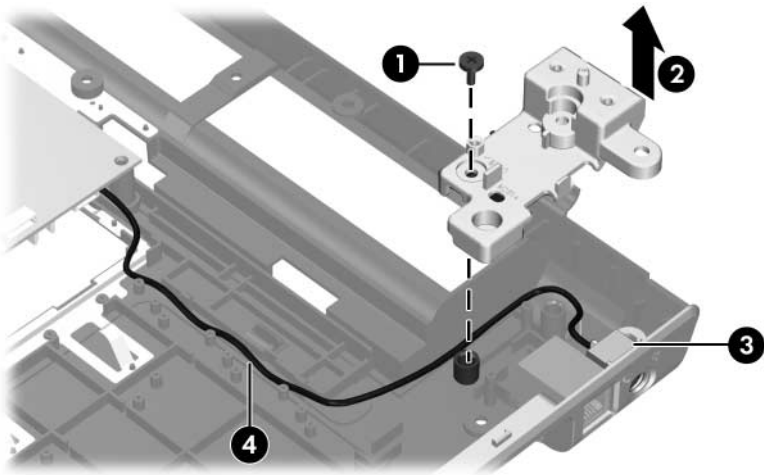
The ExpressCard slot bezel is included in the Plastics Kit, spare part number 407778-001.



Removing the ExpressCard Slot Bezel

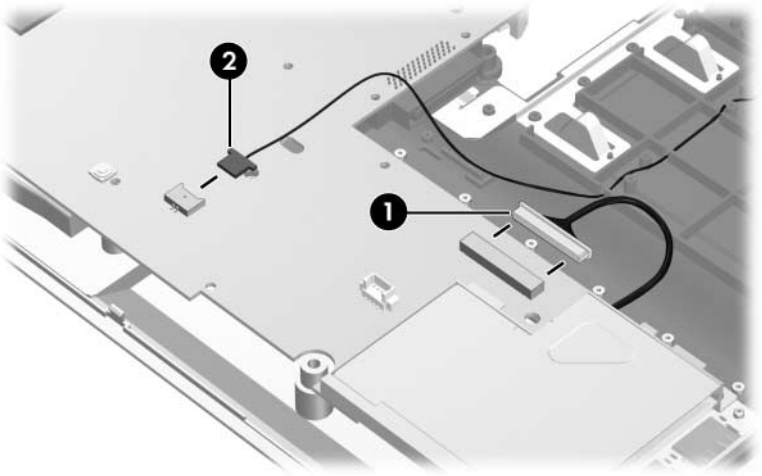
5. Remove the Phillips PM2.5×6.0 screw ❶ that secures the display hinge support to the base enclosure.
6. Remove the display hinge support ❷.
7. Remove the power connector ❸ from the clip in the base enclosure.
8. Remove the power connector cable ❹ from the clips in the base enclosure.

The display hinge support is included in the Bracket Kit, spare part number 407820-001.



Removing the Display Hinge Support and Power Connector

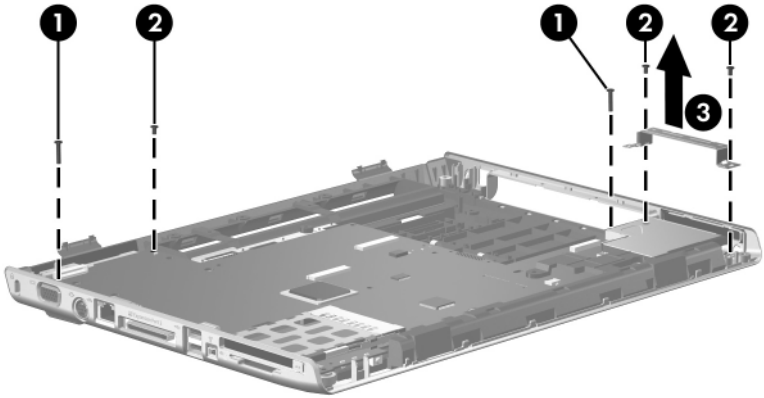
9. Disconnect the USB/audio board cable ❶ and modem cable ❷ from the system board.



Disconnecting the Modem and USB/Audio Board Cables

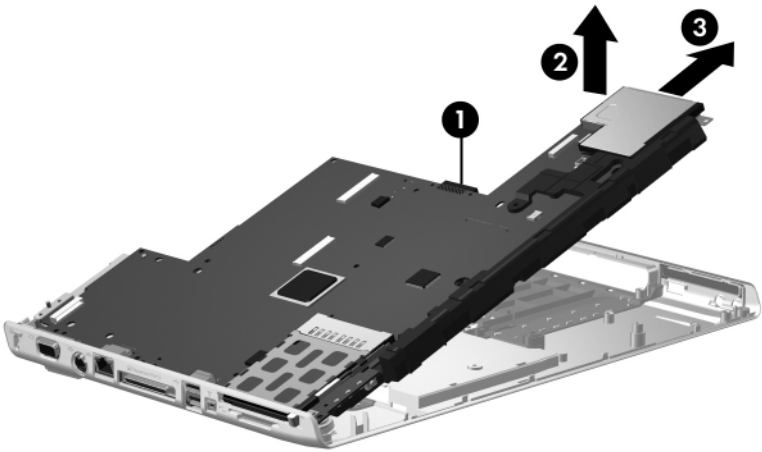
10. Remove the two Phillips PM2.5×11.0 screws ❶ and the three Phillips PM2.5×6.0 screws ❷ that secure the system board to the base enclosure.
11. Remove the ExpressCard bracket ❸.

The ExpressCard bracket is included in the Bracket Kit, spare part number 407820-001.



Removing the System Board Screws

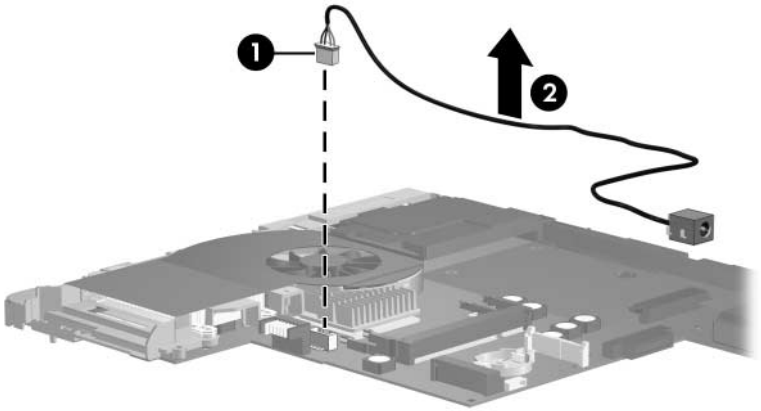
12. Use the optical drive connector ❶ to lift the right side of the system board ❷ until it is clear of the base enclosure.
13. Slide the system board ❸ to the right at an angle and remove it.



Removing the System Board

14. If it is necessary to replace the power connector cable, turn the system board upside down with the expansion port 2 toward you.
15. Disconnect the power connector cable ❶ from the system board.
16. Remove the power connector cable ❷.

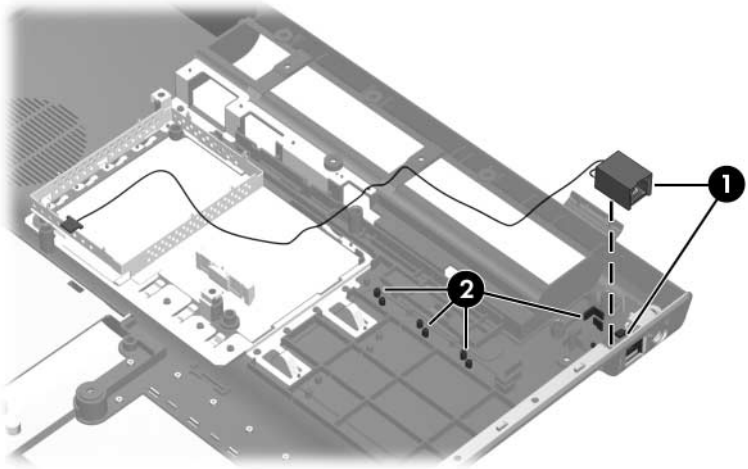
The power connector cable is available in the Cable Kit, spare part number 407774-001.



Removing the Power Connector Cable

17. If it is necessary to replace the modem connector and cable, remove the modem connector ❶ and cable ❷ from the clips and routing channel in the base enclosure.

The modem connector and cable is available in the Cable Kit, spare part number 407774-001.



Removing the Modem Connector Cable

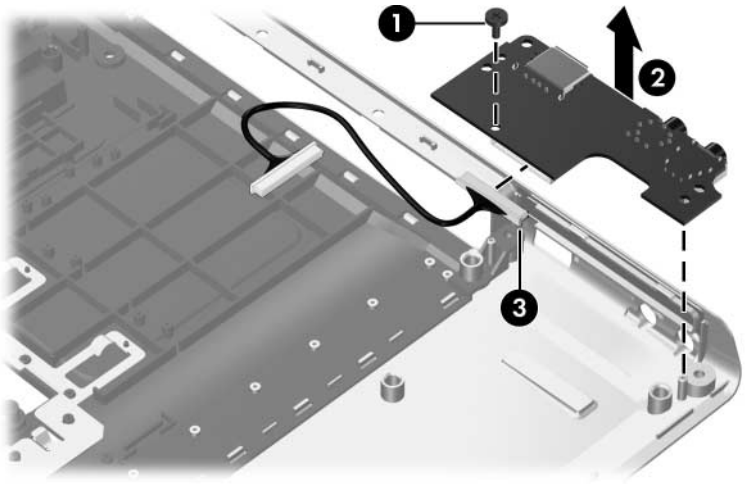
5.18 USB/Audio Board

USB/Audio Board Spare Part Number Information	
The USB/audio board includes the USB/audio board cable.	
USB/audio board	409076-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Optical drive (Section 5.9)
   c. Switch cover (Section 5.10)
   d. Keyboard assembly (Section 5.11)
   e. Display assembly (Section 5.14)
   f. Top cover (Section 5.15)
   g. System board (Section 5.17)

2. Remove the Phillips PM2.5×6.0 screw ❶ that secures the USB/audio board to the base enclosure.
3. Remove the USB/audio board ❷ from the base enclosure.
4. Disconnect the USB/audio board cable ❸ from the USB/audio board.

The USB/audio board cable is available in the Cable Kit, spare part number 407774-001.



Removing the USB/Audio Board

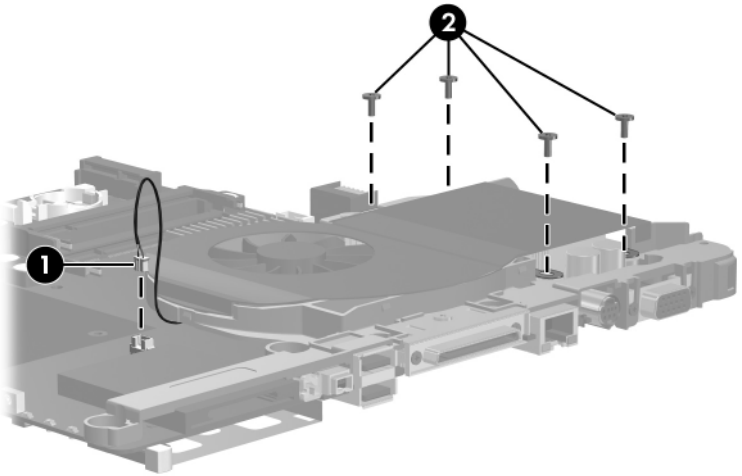
Reverse the above procedure to install the USB/audio board.

5.19 Fan/Heat Sink Assembly

Fan/Heat Sink Assembly Spare Part Number Information	
Fan assembly discrete (includes thermal paste)	418409-001
Fan assembly UMA (includes thermal paste)	413453-001
Heat sink assembly (includes thermal paste)	403827-001
Thermal module	407862-001

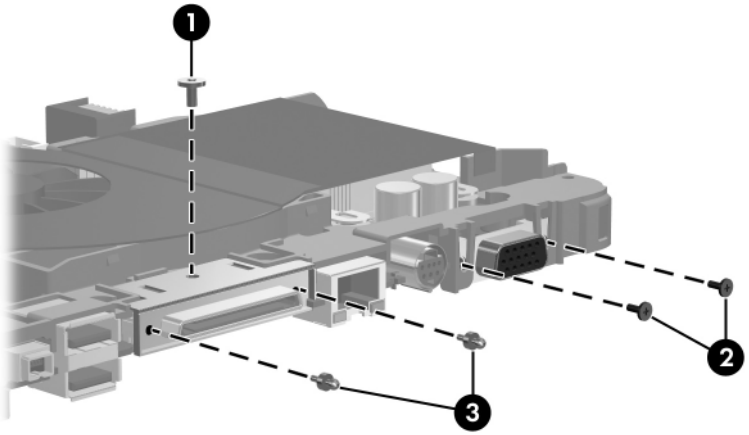
1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module compartment cover (Section 5.6)
   c. Optical drive (Section 5.9)
   d. Switch cover (Section 5.10)
   e. Keyboard assembly (Section 5.11)
   f. Display assembly (Section 5.14)
   g. Top cover (Section 5.15)
   h. System board (Section 5.17)

2. Turn the system board upside down with the expansion port 2 toward you.
3. Disconnect the fan cable ❶ from the system board.
4. Remove the four Phillips PM2.5×6.0 screws ❷ that secure the heat sink to the system board.



Removing the Fan/Heat Sink Assembly Screws, Part 1

5. Remove the following screws:
   - ❶ One Phillips PM2.5×3.0 screw that secures the expansion port 2 bracket to the system board
   - ❷ Two slotted SM1.5×9.0 screws on each side of the expansion port 2 that secure the expansion port 2 bracket to the system board
   - ❸ Two Phillips PM3.0×6.0 screws on each side of the external monitor port that secure the fan/heat sink assembly to the system board



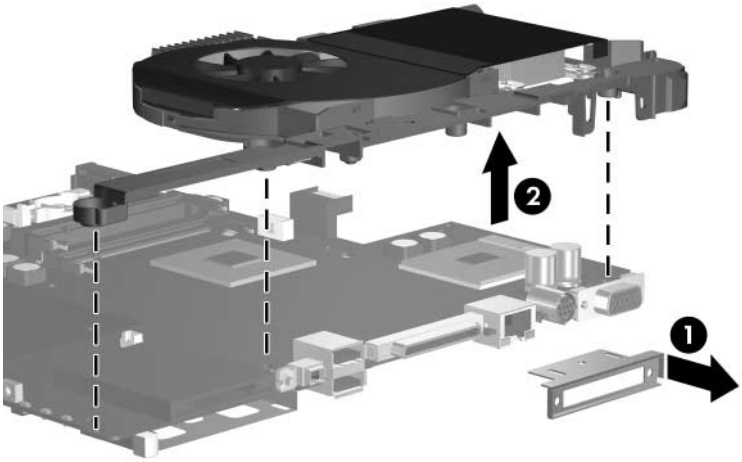
Removing the Fan/Heat Sink Assembly Screws, Part 1

6. Slide the expansion port 2 bracket ❶ away from the system board.

The spare part number for the expansion port 2 bracket is 407863-001.

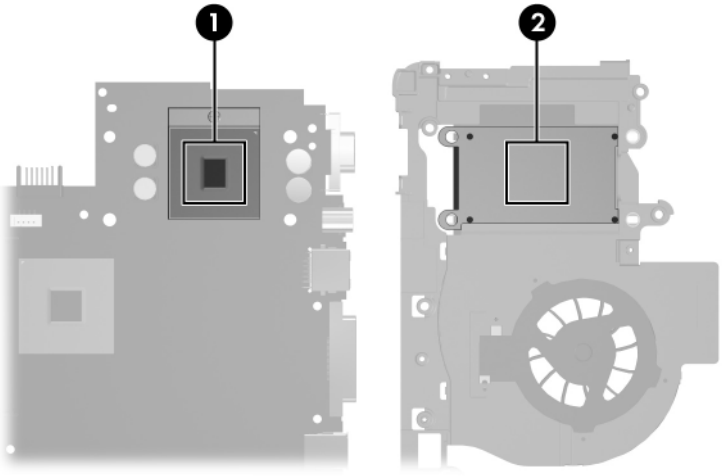
7. Remove the fan/heat sink assembly ❷.

Due to the adhesive quality of the thermal paste located between the fan/heat sink assembly and processor, it may be necessary to move the fan/heat sink assembly from side to side to detach the it from the processor.



Removing the Fan/Heat Sink Assembly

The thermal paste should be thoroughly cleaned from the surfaces of the processor ❶ and fan/heat sink assembly ❷ each time the fan/heat sink assembly is removed. Thermal paste should be reapplied to both surfaces before the fan/heat sink assembly is reinstalled. Thermal paste is included with all fan/heat sink assembly and processor spare part kits.



Replacing the Thermal Paste

Reverse the above procedure to install the fan/heat sink assembly.

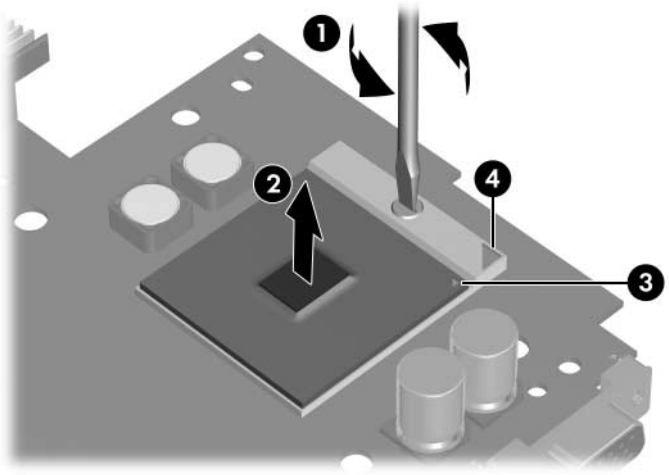
5.20 Processor

Processor Spare Part Number Information	
Intel Pentium M 2.0-GHz	407762-001
Intel Pentium M 1.83-GHz	407761-001
Intel Pentium M 1.66-GHz Dual Code	407760-001
Intel Pentium M 1.66-GHz Single Code	407764-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module compartment cover (Section 5.6)
   c. Optical drive (Section 5.9)
   d. Switch cover (Section 5.10)
   e. Keyboard assembly (Section 5.11)
   f. Display assembly (Section 5.14)
   g. Top cover (Section 5.15)
   h. System board (Section 5.17)
   i. Fan/heat sink assembly (Section 5.19)

2. Use a flat-bladed screwdriver to turn the slotted locking screw ❶ one-half turn counterclockwise.
3. Lift the processor straight up and remove it ❷.

The gold triangle ❸ on the processor should be aligned with the triangle ❹ embossed on the processor socket when you install the processor.



Removing the Processor

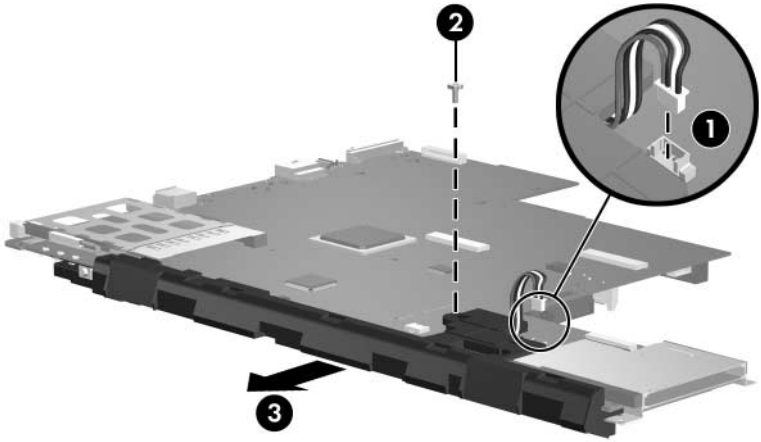
Reverse the above procedure to install the processor.

5.21 Speakers

Speaker Spare Part Number Information	
Speakers	407784-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module compartment cover (Section 5.6)
   c. Optical drive (Section 5.9)
   d. Switch cover (Section 5.10)
   e. Keyboard assembly (Section 5.11)
   f. Display assembly (Section 5.14)
   g. Top cover (Section 5.15)
   h. System board (Section 5.17)
   i. Fan/heat sink assembly (Section 5.19)

2. Turn the system board top-side up with the expansion port 2 toward you.
3. Disconnect the speaker cable ❶ from the system board.
4. Remove the Phillips PM2.5×6.0 screw ❷ that secures the speaker to the system board.
5. Slide the speaker ❸ forward and remove it from the system board.



Removing the Speaker

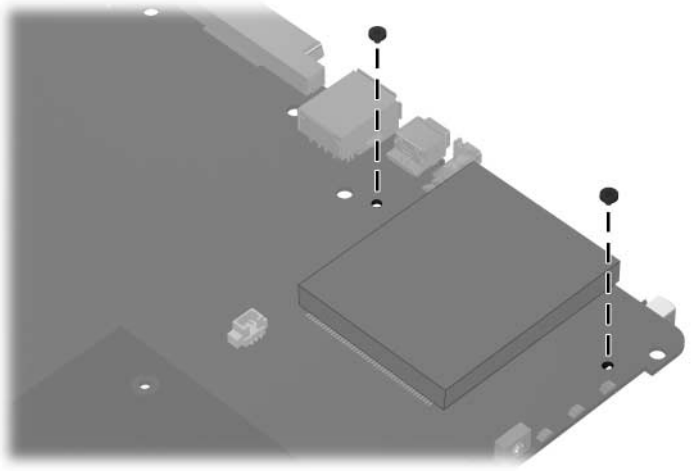
Reverse the above procedure to install the speaker.

5.22 PC Card Assembly

PC Card Assembly Spare Part Number Information	
PC Card assembly	407829-001

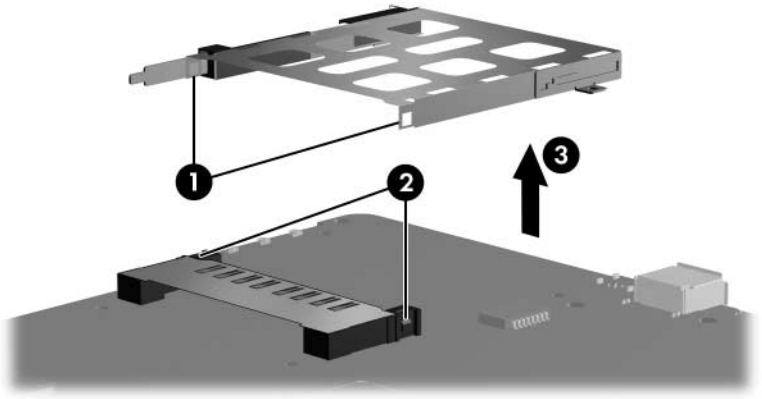
1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module compartment cover (Section 5.6)
   c. Optical drive (Section 5.9)
   d. Switch cover (Section 5.10)
   e. Keyboard assembly (Section 5.11)
   f. Display assembly (Section 5.14)
   g. Top cover (Section 5.15)
   h. System board (Section 5.17)

2. Turn the system board upside down with the expansion port 2 toward you.
3. Remove the two Phillips PM2.0×4.0 screws that secure the PC Card assembly to the system board.



Removing the PC Card Assembly Screws

4. Turn the system board top-side up with the expansion port 2 toward you.
5. Disengage the hooks ❶ on the PC Card assembly from the slots on the PC Card connector ❷.
6. Remove the PC Card assembly from the system board.



Removing the PC Card Assembly

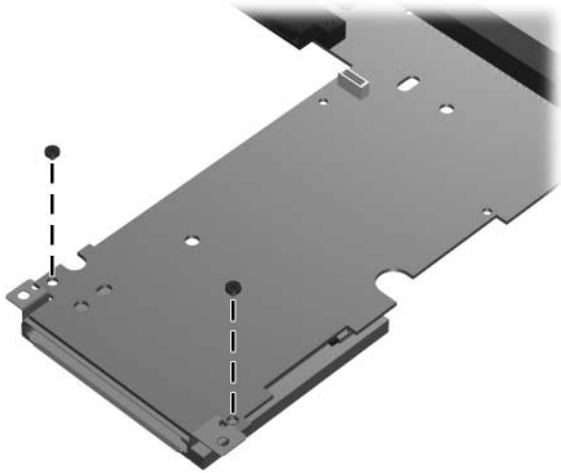
Reverse the above procedures to install the PC Card assembly.

5.23 ExpressCard Assembly

ExpressCard Assembly Spare Part Number Information	
ExpressCard assembly	407809-001

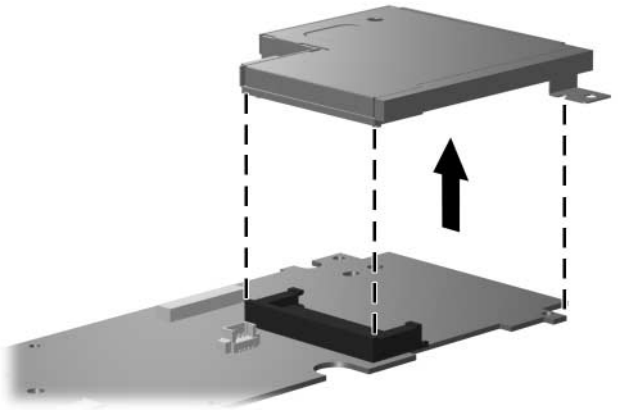
1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module compartment cover (Section 5.6)
   c. Optical drive (Section 5.9)
   d. Switch cover (Section 5.10)
   e. Keyboard assembly (Section 5.11)
   f. Display assembly (Section 5.14)
   g. Top cover (Section 5.15)
   h. System board (Section 5.17)

2. Turn the system board upside down with the expansion port 2 toward you.
3. Remove the two Phillips PM2.0×4.0 screws that secure the ExpressCard assembly to the system board.



Removing the ExpressCard Assembly Screws

4. Turn the system board top-side up with the expansion port 2 toward you.
5. Remove the ExpressCard assembly from the system board.



Removing the ExpressCard Assembly

Reverse the above procedures to install the ExpressCard assembly.

6

Specifications

This chapter provides physical and performance specifications.

Table 6-1

Computer

Dimensions	**Metric**	**U.S.**
Height		
Front	3.50 cm	1.38 in
Rear	4.50 cm	1.77 in
Width	35.79 cm	14.09 in
Depth	26.39 cm	10.39 in
Weight		
With 15.4-inch display, optical drive and 8-cell battery pack	2.99 kg	6.60 lbs
Input Power		
Operating voltage	18.5 V dc to 19.0 V dc	
Operating current	3.5 A or 4.74 A	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F

Table 6-1

Computer *(Continued)*

Relative humidity (noncondensing)		
Operating	10% to 90%	10% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random Vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	

Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.

Table 6-2

15.4-inch, WXGA, Display

Dimensions		
Height	20.7 cm	8.15 in
Width	33.1 cm	13.03 in
Diagonal	39.1 cm	15.39 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1	
Brightness	180 nits typical	
Pixel resolution		
Pitch	0.259 × 0.259 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Total power consumption	4 W	
Viewing angle	+/-65° horizontal, +50° vertical typical	

Table 6-3

Hard Drives

	120-GB*	100-GB*	80-GB*
Dimensions			
Height	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm
Weight	102 g	102 g	99 g
Interface type	ATA-5	ATA-5	ATA-5
Transfer rate			
Synchronous (maximum)	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms
Logical blocks†	234,428,430	195,364,233	156,301,488
Disc rotational speed	4200 rpm	4200 rpm	5400 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)		

✎ Certain restrictions and exclusions apply. Consult Customer Care for details.

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.

†Actual drive specifications may differ slightly.

Table 6-3

Hard Drives *(Continued)*

	80-GB*	60-GB*	40-GB*
Dimensions			
Height	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm
Weight	99 g	99 g	99 g
Interface type	ATA-5	ATA-5	ATA-5
Transfer rate			
Synchronous (maximum)	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms
Logical blocks†	156,301,488	117,210,240	78,140,160
Disc rotational speed	4200 rpm	4200 rpm	4200 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)		

✎ Certain restrictions and exclusions apply. Consult Customer Care for details.

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.

†Actual drive specifications may differ slightly.

Table 6-4

DVD/CD-RW Combo Drive

Applicable disc	**Read:** DVD-R, DVD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), CD-ROM (Mode 1 and 2) CD Digital Audio, CD-XA ready (Mode 2, Form 1 and 2), CD-I ready (Mode 2, Form 1 and 2), CD-R, CD-RW, Photo CD (single and multisession), and CD-Bridge	**Write:** CD-R and CD-RW
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Disc thickness	1.2 mm (0.047 in)	
Track pitch	0.74 µm	

Table 6-4

DVD/CD-RW Combo Drive *(Continued)*

Access time	CD media	DVD media
Random	< 110 ms	< 130 ms
Full stroke	< 210 ms	< 225 ms
Audio output level	Line-out, 0.7 V rms	
Cache buffer	2 MB	
Data transfer rate		
CD-R (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
CD-RW (10X)	1500 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

Table 6-5

DVD±RW and CD-RW Double Layer Combo Drive

Applicable disc	**Read:** DVD-R, DVD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), CD-ROM (Mode 1 and 2), CD Digital Audio, CD-XA ready (Mode 2, Form 1 and 2), CD-I ready (Mode 2, Form 1 and 2), CD-R, CD-RW, Photo CD (single and multisession), CD-Bridge	**Write:** CD-R and CD-RW DVD-R and DVD-RW
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Disc thickness	1.2 mm (0.047 in)	
Track pitch	0.74 µm	

Table 6-5

DVD±RW and CD-RW Double Layer Combo Drive *(Continued)*

Access time	CD	DVD
Random	< 175 ms	< 230 ms
Full stroke	< 285 ms	< 335 ms
Audio output level	Audio-out, 0.7 Vrms	
Cache buffer	2 MB	
Data transfer rate		
CD-R (16X)	2,400 KB/s (150 KB/s at 1X CD rate)	
CD-RW (8X)	1,200 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3,600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1,352 KB/s at 1X DVD rate)	
DVD-R (4X)	5,400 KB/s (1,352 KB/s at 1X DVD rate)	
DVD-RW (2X)	2,700 KB/s (1,352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

Table 6-6

System Interrupts

Hardware IRQ	System Function
IRQ0	System timer
IRQ1	Standard 101-/102-Key or Microsoft Natural Keyboard
IRQ2	Cascaded
IRQ3	USB2 Enhanced Host Controller—24CD
IRQ4	COM1
IRQ5*	Conexant AC—Link Audio Data Fax Modem with SmartCP
IRQ6	Diskette drive
IRQ7*	Parallel port
IRQ8	System CMOS/real-time clock
IRQ9*	Microsoft ACPI-compliant system
IRQ10*	Realtek RTL8139 Family PCI fast Ethernet Controller

Table 6-6

System Interrupts *(Continued)*

IRQ11	TI OHCI 1394 host controller TI PCI1410 CardBus controller
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE channel

*Default configuration; audio possible configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.

✎ PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.

Table 6-7

System I/O Addresses

I/O Address (hex)	**System Function** (shipping configuration)
000 - 00F	DMA controller no. 1
010 - 01F	Unused
020 - 021	Interrupt controller no. 1
022 - 024	Opti chipset configuration registers
025 - 03F	Unused
02E - 02F	87334 “Super I/O” configuration for CPU
040 - 05F	Counter/timer registers
044 - 05F	Unused
060	Keyboard controller
061	Port B
062 - 063	Unused
064	Keyboard controller
065 - 06F	Unused
070 - 071	NMI enable/RTC
072 - 07F	Unused
080 - 08F	DMA page registers
090 - 091	Unused
092	Port A
093 - 09F	Unused
0A0 - 0A1	Interrupt controller no. 2

Table 6-7

System I/O Addresses *(Continued)*

I/O Address (hex)	**System Function** (shipping configuration)
0A2 - 0BF	Unused
0C0 - 0DF	DMA controller no. 2
0E0 - 0EF	Unused
0F0 - 0F1	Coprocessor busy clear/reset
0F2 - 0FF	Unused
100 - 16F	Unused
170 - 177	Secondary fixed disk controller
178 - 1EF	Unused
1F0 - 1F7	Primary fixed disk controller
1F8 - 200	Unused
201	Joystick (decoded in ESS1688)
202 - 21F	Unused
220 - 22F	Entertainment audio
230 - 26D	Unused
26E - 26	Unused
278 - 27F	Unused
280 - 2AB	Unused
2A0 - 2A7	Unused
2A8 - 2E7	Unused
2E8 - 2EF	Reserved serial port

Table 6-7

System I/O Addresses *(Continued)*

I/O Address (hex)	**System Function** (shipping configuration)
2F0 - 2F7	Unused
2F8 - 2FF	Infrared port
300 - 31F	Unused
320 - 36F	Unused
370 - 377	Secondary diskette drive controller
378 - 37F	Parallel port (LPT1/default)
380 - 387	Unused
388 - 38B	FM synthesizer—OPL3
38C - 3AF	Unused
3B0 - 3BB	VGA
3BC - 3BF	Reserved (parallel port/no EPP support)
3C0 - 3DF	VGA
3E0 - 3E1	PC Card controller in CPU
3E2 - 3E3	Unused
3E8 - 3EF	Internal modem
3F0 - 3F7	“A” diskette controller
3F8 - 3FF	Serial port (COM1/default)
CF8 - CFB	PCI configuration index register (PCIDIVO-1)
CFC - CFF	PCI configuration data register (PCIDIVO-1)

Table 6-8

System Memory Map

Size	Memory Address	System Function
640 KB	00000000-0009FFFF	Base memory
128 KB	000A0000-000BFFFF	Video memory
48 KB	000C0000-000CBFFF	Video BIOS
160 KB	000C8000-000E7FFF	Unused
64 KB	000E8000-000FFFFF	System BIOS
15 MB	00100000-00FFFFFF	Extended memory
58 MB	01000000-047FFFFF	Super extended memory
58 MB	04800000-07FFFFFF	Unused
2 MB	08000000-080FFFFF	Video memory (direct access)
4 GB	08200000-FFFEFFFF	Unused
64 KB	FFFF0000-FFFFFFFF	System BIOS

Table 6-9

System DMA

Hardware DMA	System Function
DMA0	Not applicable
DMA1*	Not applicable
DMA2*	Not applicable
DMA3	Not applicable
DMA4	Direct memory access controller
DMA5*	Available for PC Card
DMA6	Not assigned
DMA7	Not assigned

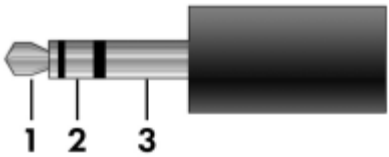
*PC Card controller can use DMA 1, 2, or 5.

A

Connector Pin Assignments

Table A-1

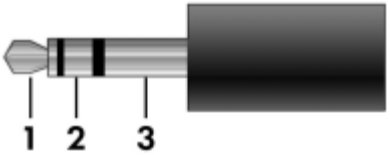
Audio-Out (Headphone)



Pin	Signal	Pin	Signal
1	Audio out, left channel	3	Ground
2	Audio out, right channel		

Table A-2

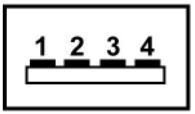
Audio-In (Microphone)



Pin	Signal	Pin	Signal
1	Audio signal in	3	Ground
2	Audio signal in		

Table A-3

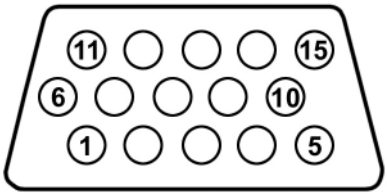
Universal Serial Bus



Pin	Signal	Pin	Signal
1	+5 VDC	3	Data +
2	Data –	4	Ground

Table A-4

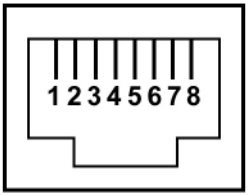
External Monitor



Pin	Signal	Pin	Signal
1	Red analog	9	+5 VDC
2	Green analog	10	Ground
3	Blue analog	11	Monitor detect
4	Not connected	12	DDC 2B data
5	Ground	13	Horizontal sync
6	Ground analog	14	Vertical sync
7	Ground analog	15	DDC 2B clock
8	Ground analog		

Table A-5

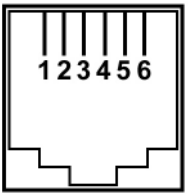
RJ-45 (Network)



Pin	Signal	Pin	Signal
1	Transmit +	5	Unused
2	Transmit –	6	Receive –
3	Receive +	7	Unused
4	Unused	8	Unused

Table A-6

RJ-11 (Modem)



Pin	Signal	Pin	Signal
1	Unused	4	Unused
2	Tip	5	Unused
3	Ring	6	Unused

Table A-7

S-Video-Out

Pin	Signal	Pin	Signal
1	S-VHS color (C) signal	5	TV-CD
2	Composite video signal	6	S-VHS intensity ground
3	S-VHS intensity (Y) signal	7	Composite video ground
4	S-VHS color ground		

B

Power Cord Set Requirements

3-Conductor Power Cord Set

The wide range input feature of the computer permits it to operate from any line voltage from 100 to 120 or 220 to 240 volts AC.

The power cord set included with the computer meets the requirements for use in the country where the equipment is purchased.

Power cord sets for use in other countries must meet the requirements of the country where the computer is used.

General Requirements

The requirements listed below are applicable to all countries.

- The length of the power cord set must be at least 1.5 m (5.0 ft) and a maximum of 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by each country's power system.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Country-Specific Requirements

3-Conductor Power Cord Set Requirements

Country/Region	Accredited Agency	Applicable Note Number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3

NOTES:

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.

3-Conductor Power Cord Set Requirements *(Continued)*

Country/Region	Accredited Agency	Applicable Note Number
Korea	EK	4
The Netherlands	KE A	1
Norway	NEMKO	1
People's Republic of China	CCC	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
United Kingdom	BSI	1
United States	UL	2

NOTES:

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

C

Screw Listing

This appendix provides specification and reference information for the screws and screw locks used in the computer. All screws listed in this appendix are available in the Computer Screw Kit, spare part number 407782-001, and the Display Screw Kit, spare part number 407794-001.

Table C-1

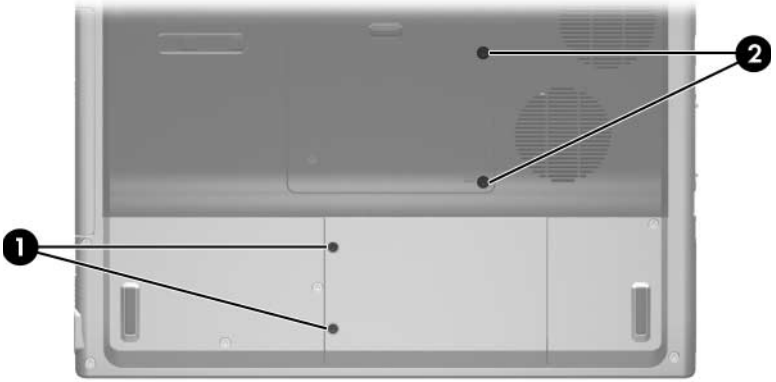
Black Phillips PM2.5×5.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	4	5.0 mm	2.5 mm	6.0 mm

Where used:

❶ Two screws that secure the hard drive cover to the computer (screws are captured on the cover by C clips; documented in Section 5.4)

❷ Two screws that secure the memory/Mini Card module compartment cover to the computer (screws are captured on the cover by C clips; documented in Section 5.6)



Black Phillips PM2.5×5.0 Screw Locations

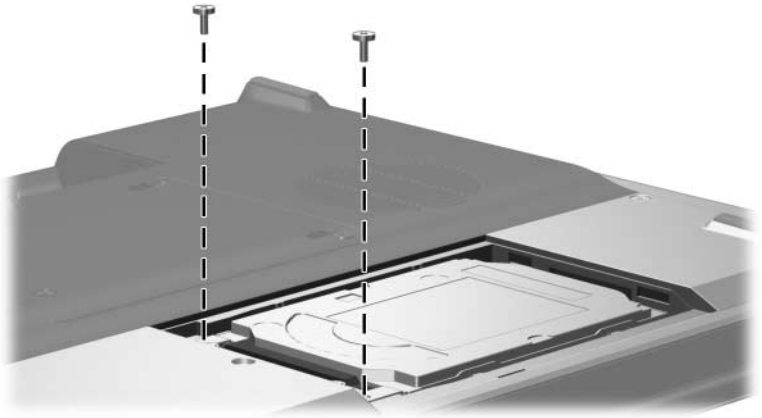
Table C-2

Phillips PM2.5×6.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	6.0 mm	2.5 mm	6.0 mm

Where used:

2 screws that secure the hard drive to the computer (documented in Section 5.4)



Phillips PM2.5×6.0 Screw Locations

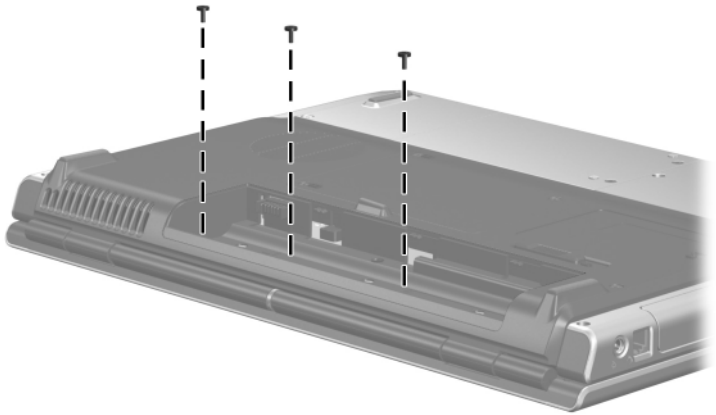
Table C-2

Phillips PM2.5×6.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	6.0 mm	2.5 mm	6.0 mm

Where used:

3 screws that secure the switch cover to the computer (documented in Section 5.10)



Phillips PM2.5×6.0 Screw Locations

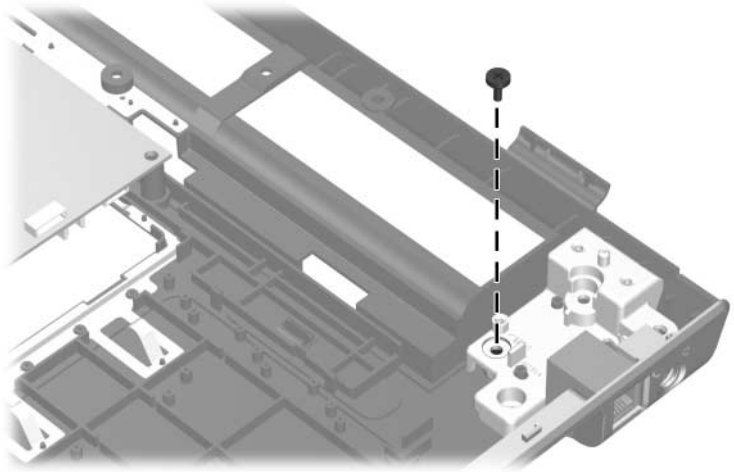
Table C-2

Phillips PM2.5×6.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	6.0 mm	2.5 mm	6.0 mm

Where used:

One screw that secures the display hinge support to the base enclosure (documented in Section 5.17)



Phillips PM2.5×6.0 Screw Location

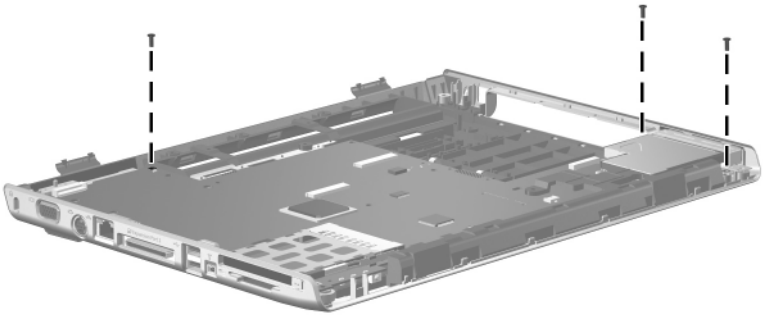
Table C-2

Phillips PM2.5×6.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	6.0 mm	2.5 mm	6.0 mm

Where used:

3 screws that secure the top cover to the computer (documented in Section 5.15)



Phillips PM2.5×6.0 Screw Locations

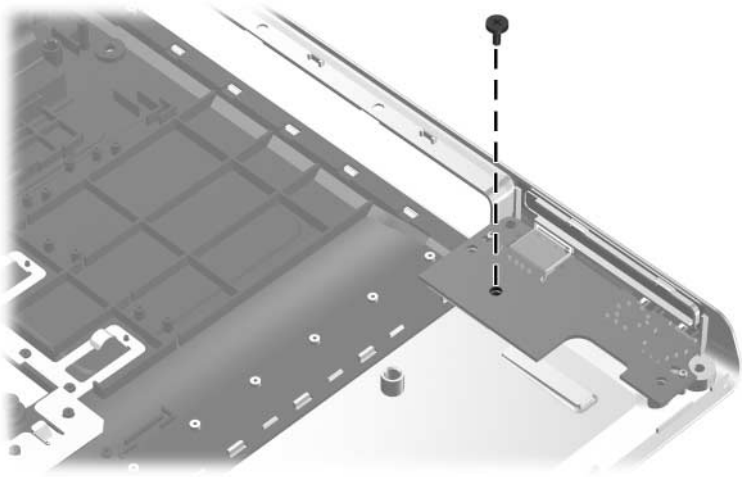
Table C-2

Phillips PM2.5×6.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	6.0 mm	2.5 mm	6.0 mm

Where used:

One screw that secures the USB/audio board to the base enclosure (documented in Section 5.18)



Phillips PM2.5×6.0 Screw Location

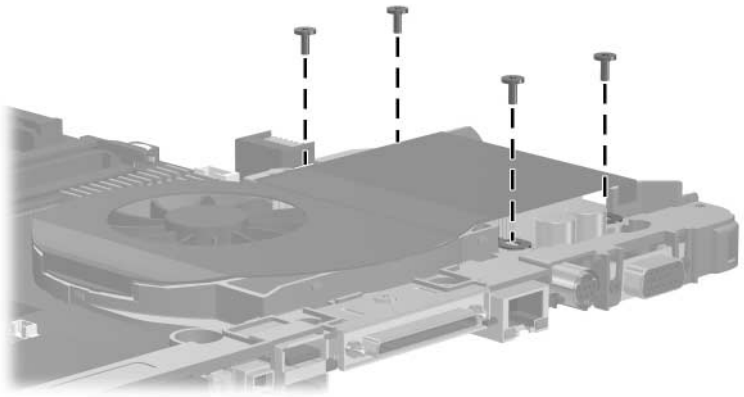
Table C-2

Phillips PM2.5×6.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	6.0 mm	2.5 mm	6.0 mm

Where used:

4 screws that secure the fan/heat sink assembly to the system board (documented in Section 5.19)



Phillips PM2.5×6.0 Screw Locations

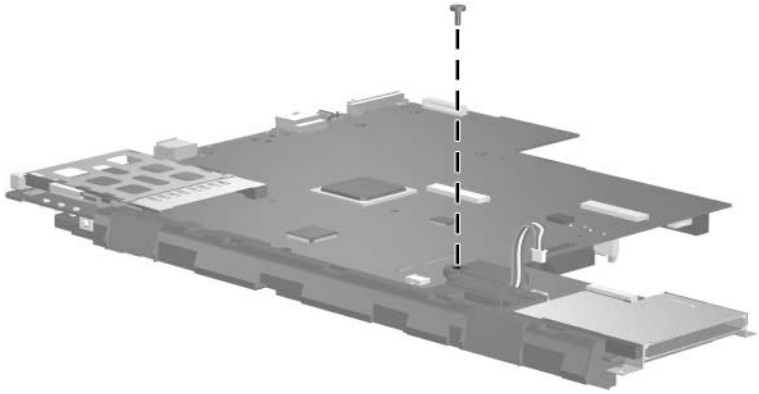
Table C-2

Phillips PM2.5×6.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	6.0 mm	2.5 mm	6.0 mm

Where used:

One screw that secures the speakers to the system board (documented in Section 5.21)



Phillips PM2.5×6.0 Screw Location

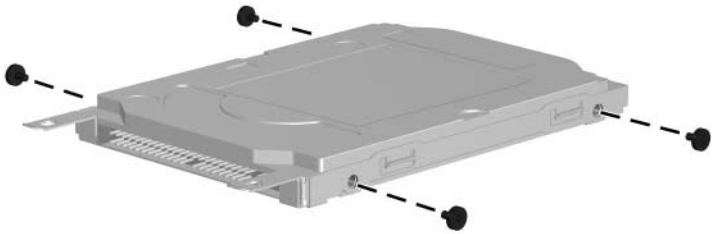
Table C-3

Phillips PM3.0×3.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	4	3.0 mm	3.0 mm	5.0 mm

Where used:

4 screws that secure the hard drive frame to the hard drive (documented in Section 5.4)



Phillips PM3.0×3.0 Screw Locations

Table C-4

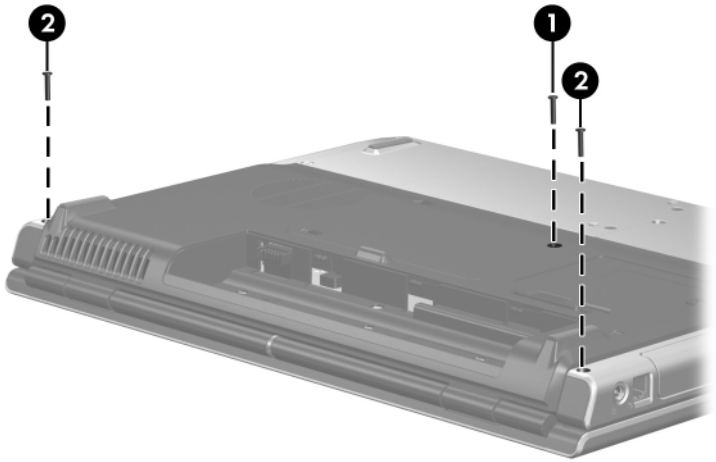
Phillips PM2.5×11.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	20	11.0 mm	2.5 mm	6.0 mm

Where used:

❶ One screw that secures the optical drive to the computer (documented in Section 5.9)

❷ Two screws that secure the switch cover to the computer (documented in Section 5.10)



Phillips PM2.5×11.0 Screw Locations

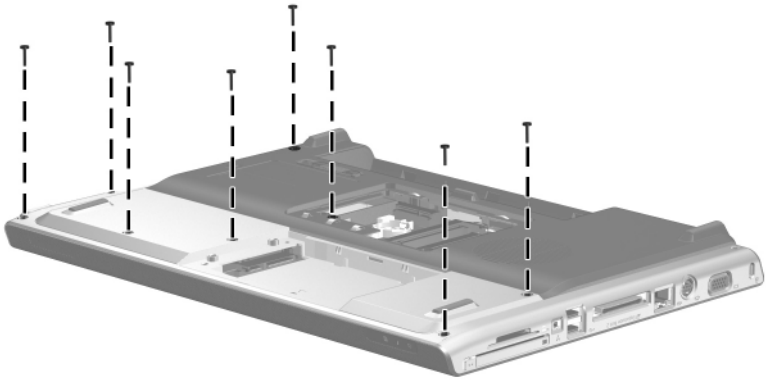
Table C-4

Phillips PM2.5×11.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	20	11.0 mm	2.5 mm	6.0 mm

Where used:

8 screws that secure the top cover to the computer (documented in Section 5.15)



Phillips PM2.5×11.0 Screw Locations

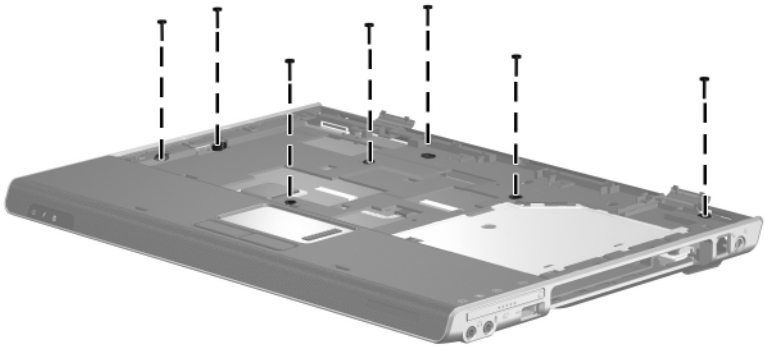
Table C-4

Phillips PM2.5×11.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	20	11.0 mm	2.5 mm	6.0 mm

Where used:

7 screws that secure the top cover to the computer (documented in Section 5.15)



Phillips PM2.5×11.0 Screw Locations

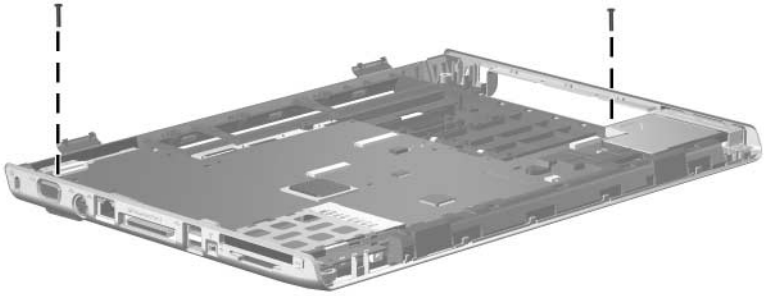
Table C-4

Phillips PM2.5×11.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	20	11.0 mm	2.5 mm	6.0 mm

Where used:

2 screws that secure the system board to the base enclosure (documented in Section 5.17)



Phillips PM2.5×11.0 Screw Locations

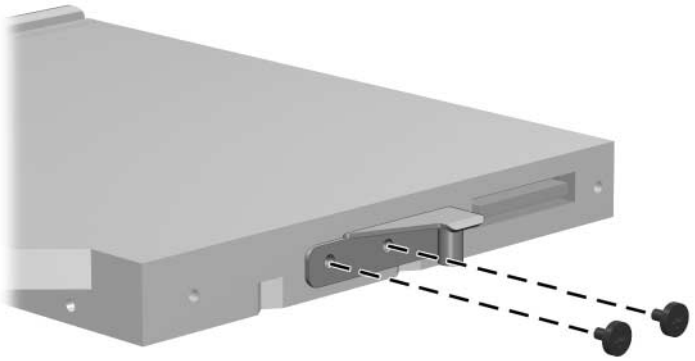
Table C-5

Phillips PM2.0×4.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	22	4.0 mm	2.0 mm	5.0 mm

Where used:

2 screws that secure the optical drive bracket to the optical drive (documented in Section 5.9)



Phillips PM2.0×4.0 Screw Locations

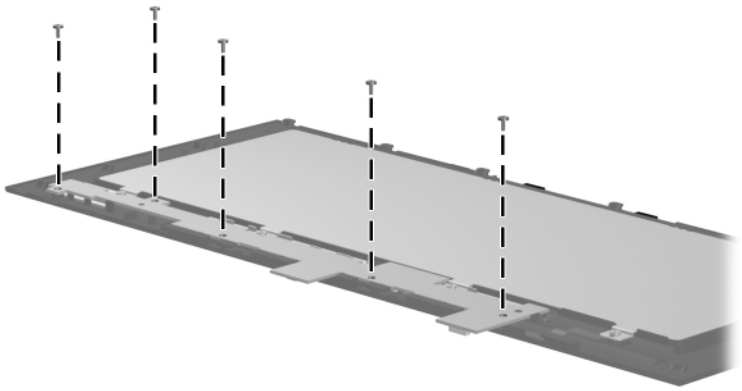
Table C-5

Phillips PM2.0×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	22	4.0 mm	2.0 mm	5.0 mm

Where used:

5 screws that secure the LED board to the keyboard frame (documented in Section 5.12)



Phillips PM2.0×4.0 Screw Locations

Table C-5

Phillips PM2.0×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	22	4.0 mm	2.0 mm	5.0 mm

Where used:

8 screws that secure the display hinges to the display panel (documented in Section 5.14)

Phillips PM2.0×4.0 Screw Locations

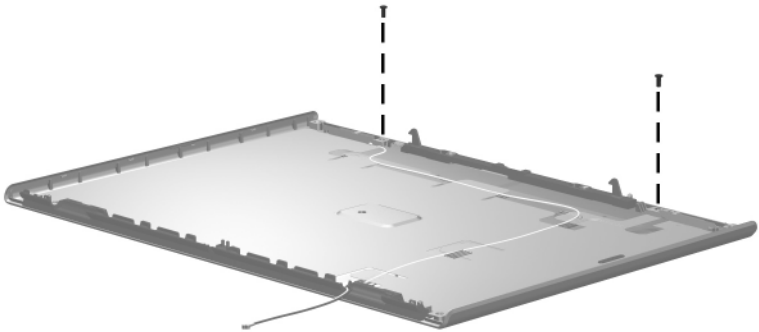
Table C-5

Phillips PM2.0×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	22	4.0 mm	2.0 mm	5.0 mm

Where used:

2 screws that secure the wireless transceivers to the display enclosure (documented in Section 5.14)



Phillips PM2.0×4.0 Screw Locations

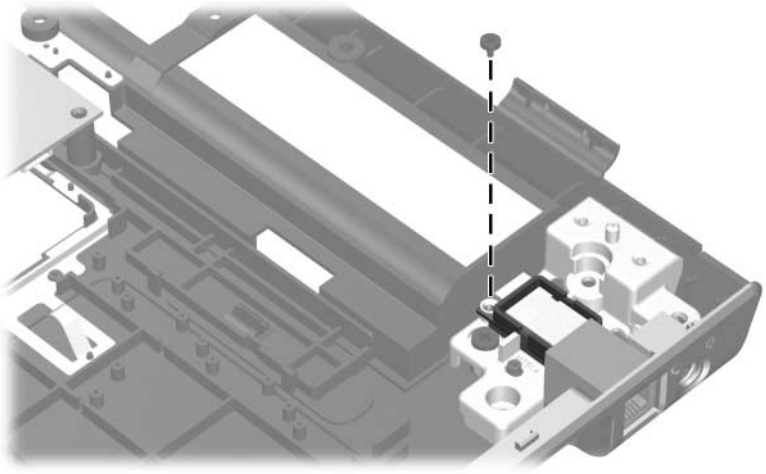
Table C-5

Phillips PM2.0×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	22	4.0 mm	2.0 mm	5.0 mm

Where used:

One screw that secures the Bluetooth module to the display hinge support (documented in Section 5.16)



Phillips PM2.0×4.0 Screw Location

Table C-5

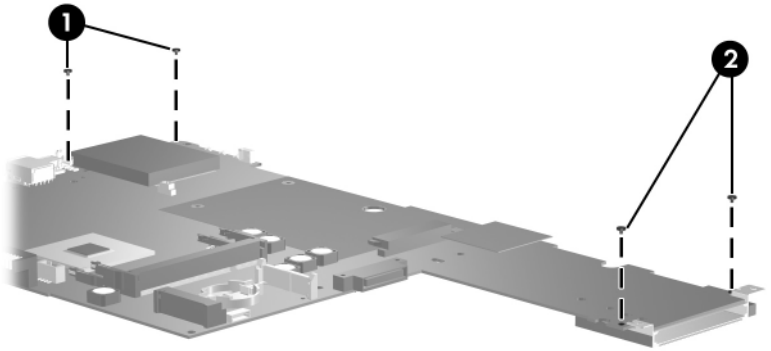
Phillips PM2.0×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	22	4.0 mm	2.0 mm	5.0 mm

Where used:

❶ Two screws that secure the PC Card assembly to the system board (documented in Section 5.22)

❷ Two screws that secure the ExpressCard assembly to the system board (documented in Section 5.23)



Phillips PM2.0×4.0 Screw Locations

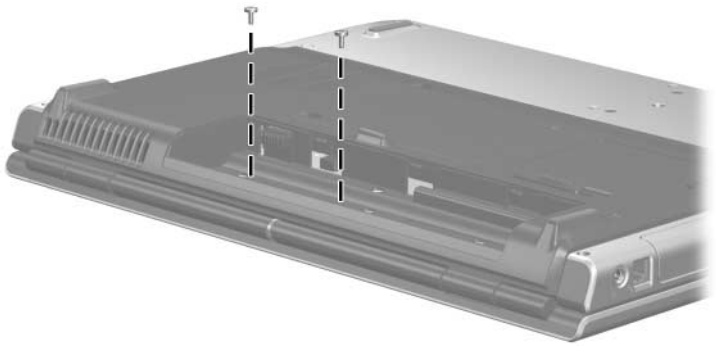
Table C-6

Silver Phillips PM2.5×5.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	6	5.0 mm	2.5 mm	5.0 mm

Where used:

2 screws that secure the switch cover to the computer (documented in Section 5.10)



Silver Phillips PM2.5×5.0 Screw Locations

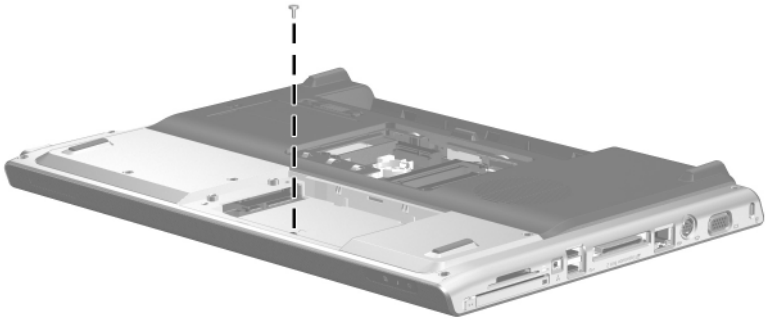
Table C-6

Silver Phillips PM2.5×5.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	6	5.0 mm	2.5 mm	5.0 mm

Where used:

One screw that secures the top cover to the computer (documented in Section 5.15)



Silver Phillips PM2.5×5.0 Screw Location

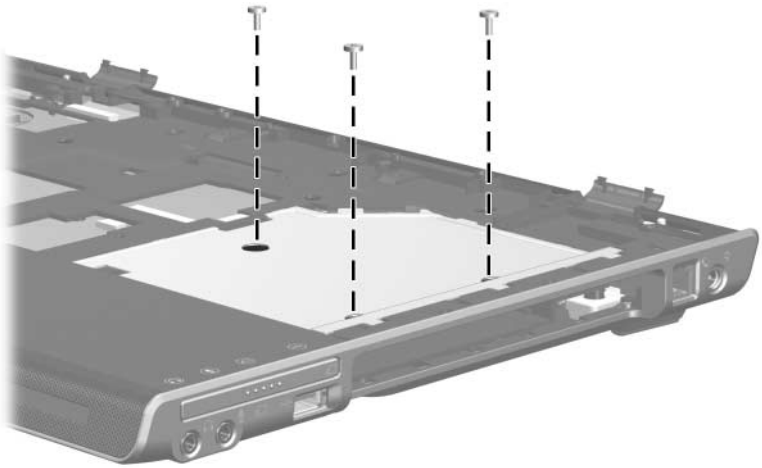
Table C-6

Silver Phillips PM2.5×5.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	6	5.0 mm	2.5 mm	5.0 mm

Where used:

3 screws that secure the top cover to the computer (documented in Section 5.15)



Silver Phillips PM2.5×5.0 Screw Locations

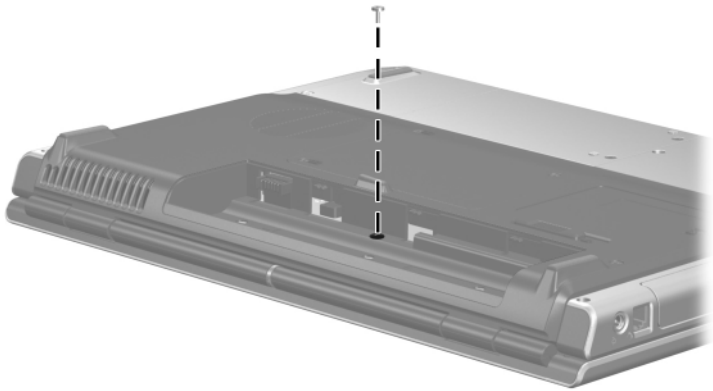
Table C-7

Phillips PM2.0×6.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	1	6.0 mm	2.0 mm	5.0 mm

Where used:

One screw that secures the keyboard frame to the computer (documented in Section 5.11)



Phillips PM2.0×6.0 Screw Location

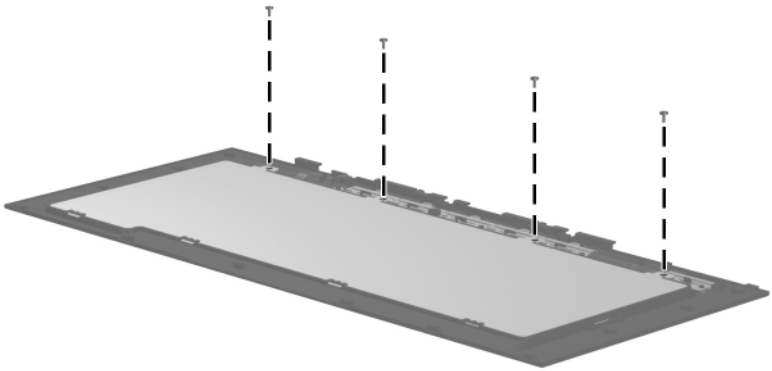
Table C-8

Phillips PM2.0×3.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	4	3.0 mm	2.0 mm	5.0 mm

Where used:

4 screws that secure the keyboard to the keyboard frame (documented in Section 5.13)



Phillips PM2.0×3.0 Screw Locations

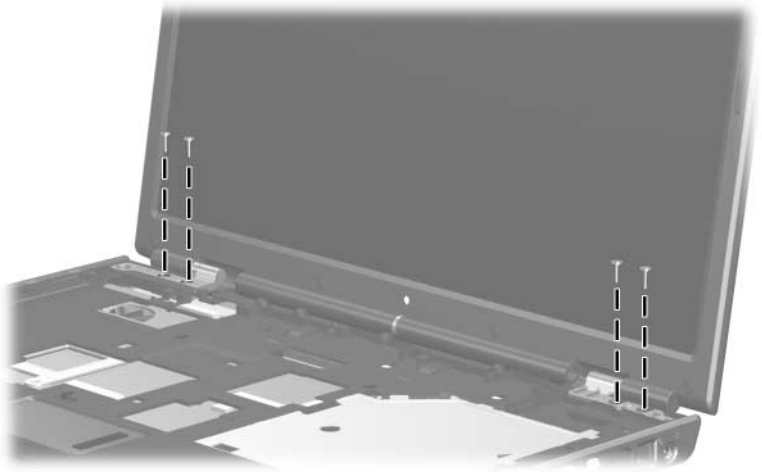
Table C-9

Phillips PM2.5×7.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	14	7.0 mm	2.5 mm	5.0 mm

Where used:

4 screws that secure the display assembly to the computer (documented in Section 5.14)



Phillips PM2.5×7.0 Screw Locations

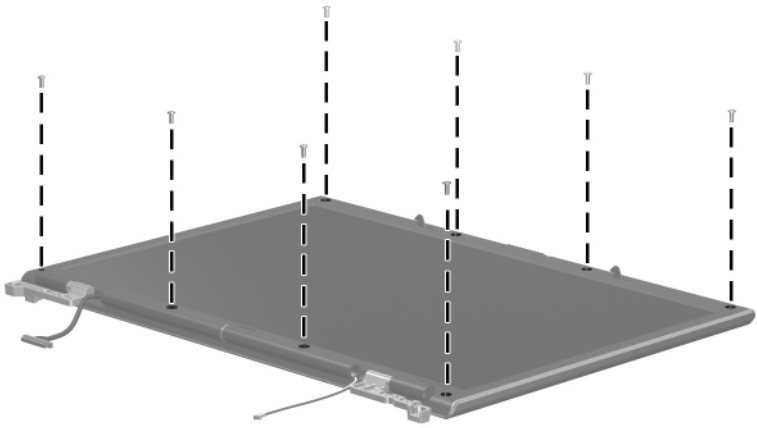
Table C-9

Phillips PM2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	14	7.0 mm	2.5 mm	5.0 mm

Where used:

8 screws that secure the display bezel to the display enclosure (documented in Section 5.14)



Phillips PM2.5×7.0 Screw Locations

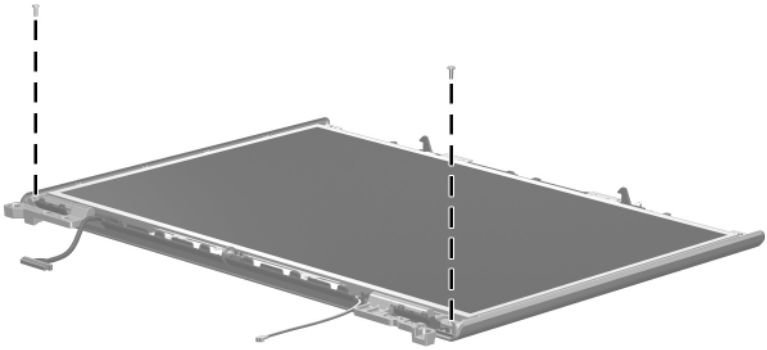
Table C-9

Phillips PM2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	14	7.0 mm	2.5 mm	5.0 mm

Where used:

2 screws that secure the display panel to the display enclosure (documented in Section 5.14)



Phillips PM2.5×7.0 Screw Locations

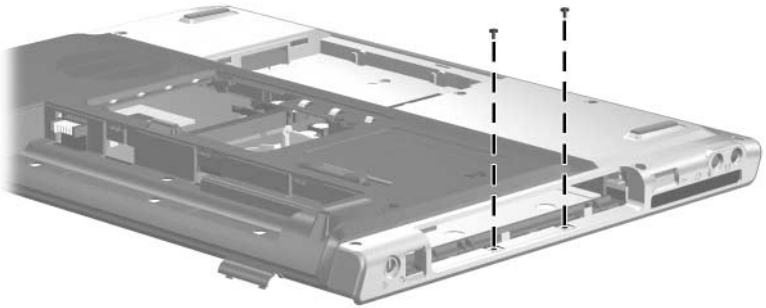
Table C-10

Phillips PM2.5×3.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	3	3.0 mm	2.5 mm	6.0 mm

Where used:

2 screws that secure the top cover to the computer (documented in Section 5.15)



Phillips PM2.5×3.0 Screw Locations

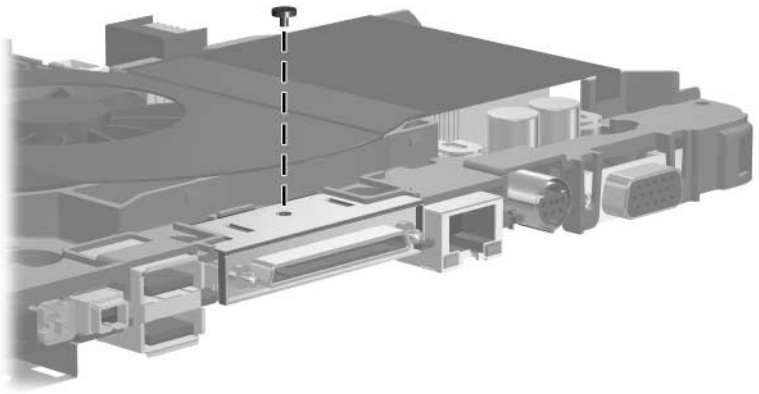
Table C-10

Phillips PM2.5×3.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	3	3.0 mm	2.5 mm	6.0 mm

Where used:

One screw that secures the fan/heat sink assembly to the system board (documented in Section 5.19)



Phillips PM2.5×3.0 Screw Location

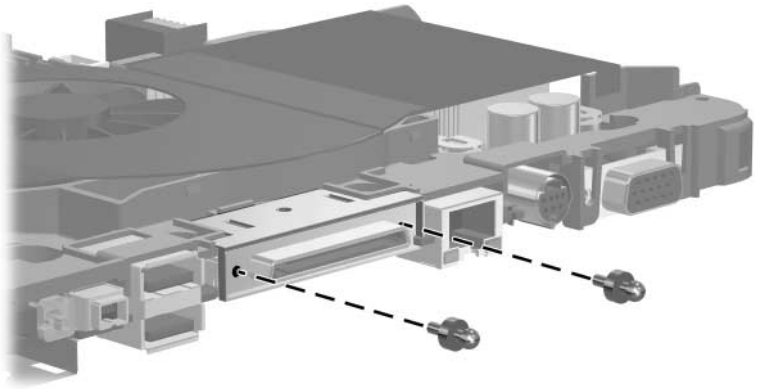
Table C-11

Slotted SM1.5×9.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	2	9.0 mm	1.5 mm	2.0 mm

Where used:

2 screws that secure the expansion port 2 bracket and fan/heat sink assembly to the system board (documented in Section 5.19)



Slotted SM1.5×9.0 Screw Locations

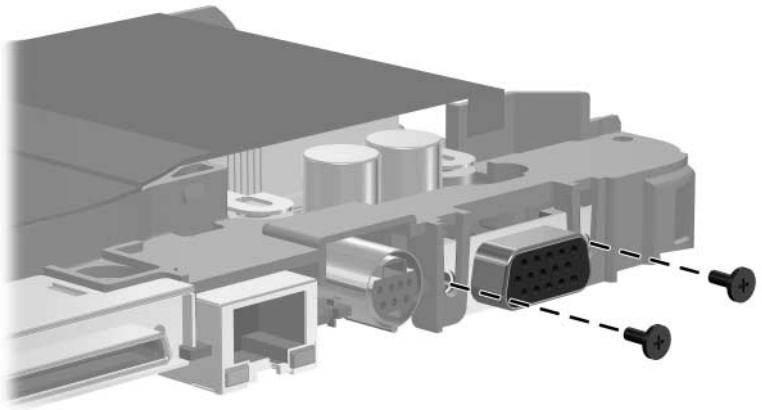
Table C-12

Phillips PM3.0×6.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	2	6.0 mm	3.0 mm	5.0 mm

Where used:

2 screws that secure the fan/heat sink assembly to the system board (documented in Section 5.19)



Phillips PM3.0×6.0 Screw Locations

D

Display Component Recycling

WARNING: The backlight contains mercury. Caution should be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

CAUTION: The procedures in this appendix can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. Careful handling should be exercised when removing these components.

Materials Disposal

This HP product contains mercury in the display assembly backlight and may require special handling at end-of-life.

Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities or visit the Electronic Industries Alliance (EIA) at http://www.eiae.org.

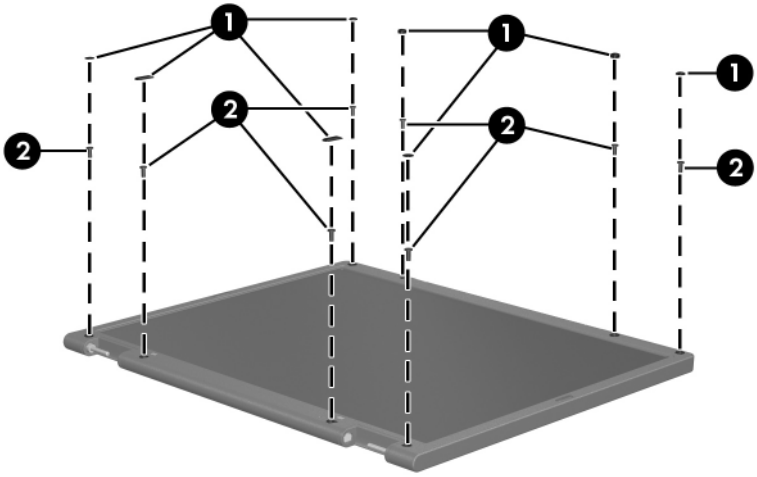
This appendix provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight ❶ and the LCD panel ❷.

Disassembly procedures differ from one display assembly to another. The procedures provided in this appendix are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Refer to Section 5.14, "Display Assembly," for display assembly disassembly steps.

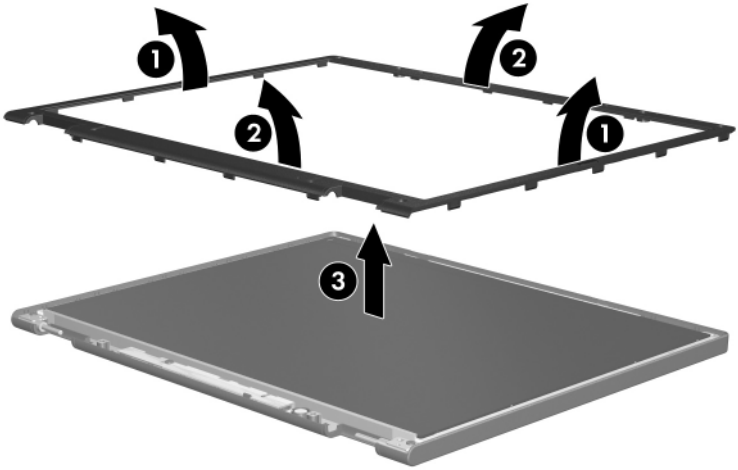
Perform the following steps to disassemble the display assembly:

1. Remove all screw covers ❶ and screws ❷ that secure the display bezel to the display assembly.



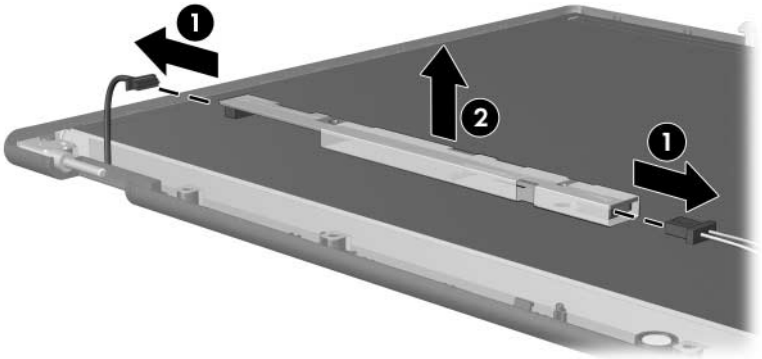
Removing the Display Bezel Screw Covers and Screws

2. Lift up and out on the left and right inside edges ❶ and the top and bottom inside edges ❷ of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel ❸.



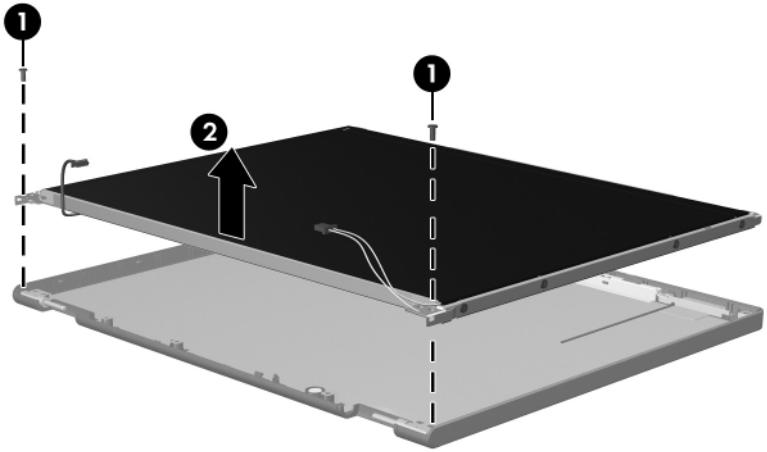
Removing the Display Bezel

4. Disconnect all LCD panel cables ❶ from the display inverter board and remove the inverter board ❷.



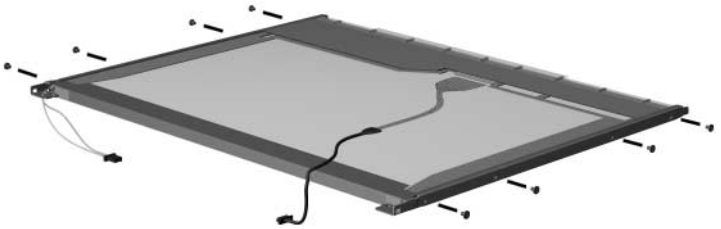
Removing the Display Inverter Board

5. Remove all screws ❶ that secure the LCD panel to the display enclosure.
6. Remove the LCD panel ❷ from the display enclosure.



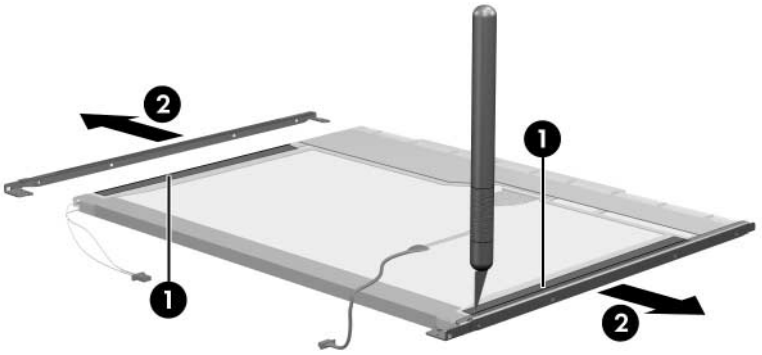
Removing the LCD Panel

7. Turn the LCD panel upside down.
8. Remove all screws that secure the LCD panel frame to the LCD panel.



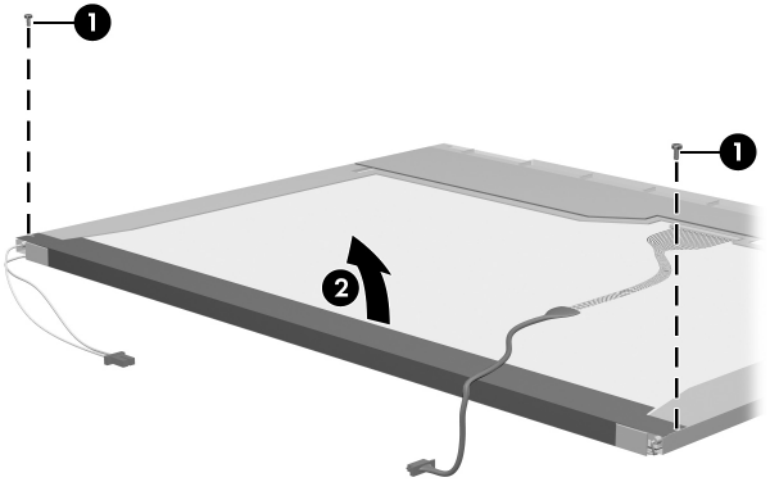
Removing the LCD Panel Frame Screws

9. Use a sharp-edged tool to cut the tape ❶ that secures the side of the LCD panel to the LCD panel frame.
10. Remove the LCD panel frame ❷ from the display panel.



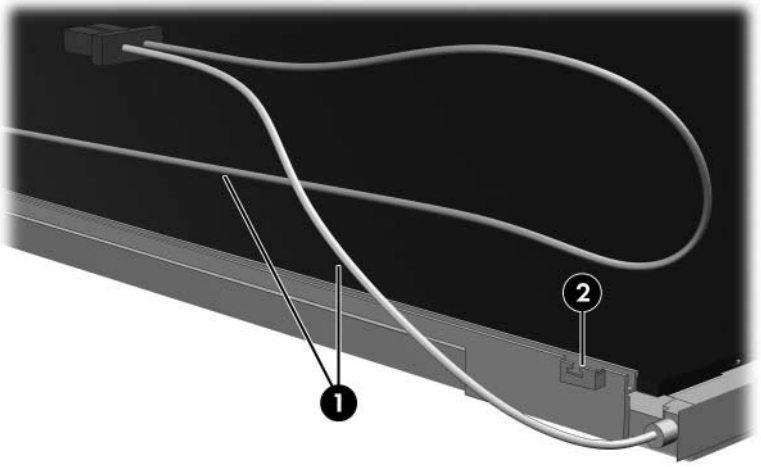
Removing the LCD Panel Frame

11. Remove the screws ❶ that secure the backlight cover to the LCD panel.
12. Lift the top edge of the backlight cover ❷ and swing it forward.
13. Remove the backlight cover.



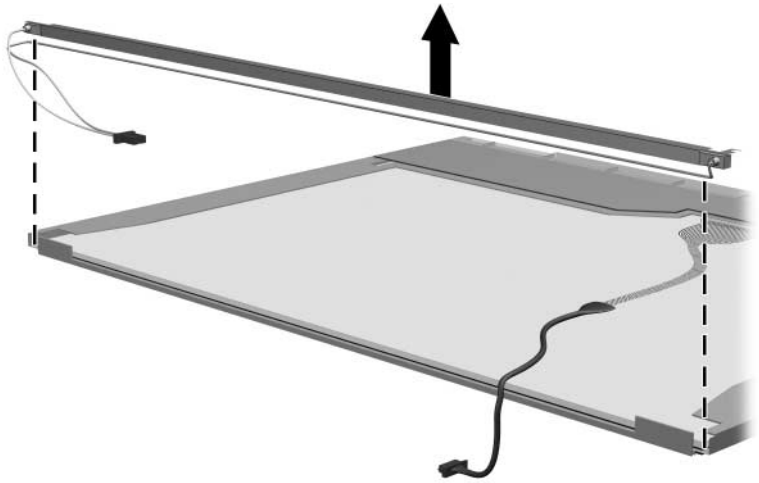
Removing the Backlight Cover

14. Turn the LCD panel right-side up.
15. Remove the backlight cables ❶ from the clip ❷ in the LCD panel.



Releasing the Backlight Cables

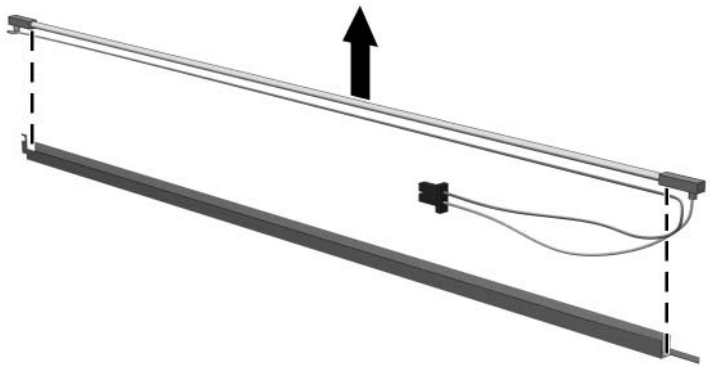
16. Turn the LCD panel upside down.
17. Remove the backlight frame from the LCD panel.



Removing the Backlight Frame

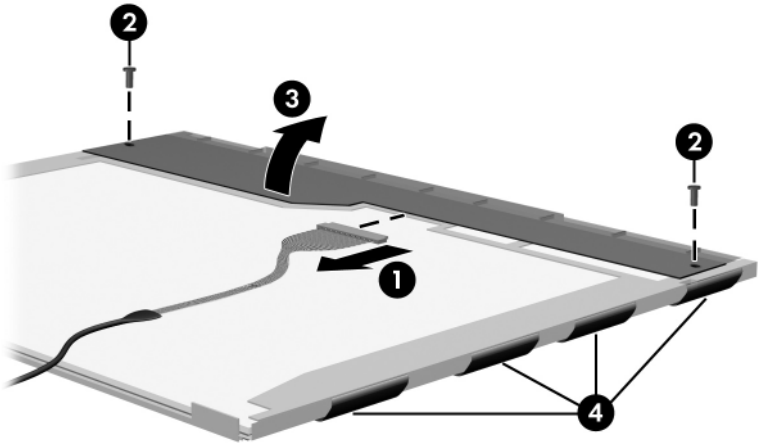
WARNING: The backlight contains mercury. Caution should be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

18. Slide the backlight out of the backlight frame.



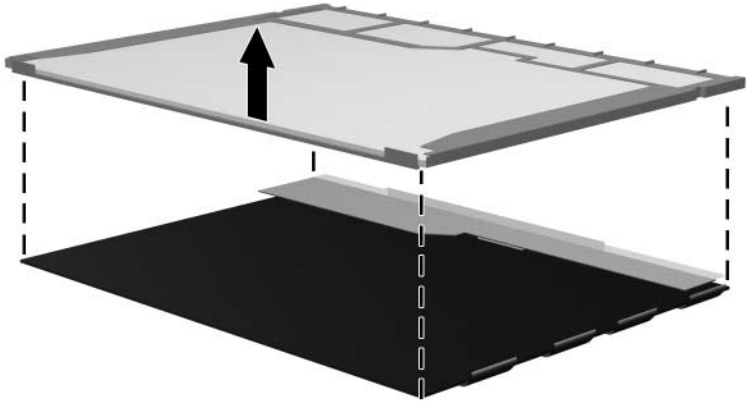
Removing the Backlight

19. Disconnect the display cable ❶ from the LCD panel.
20. Remove the screws ❷ that secure the LCD panel to the LCD rear panel.
21. Release the LCD panel ❸ from the LCD rear panel.
22. Release the tape ❹ that secures the LCD panel to the LCD rear panel.



Releasing the LCD Panel

23. Remove the LCD panel.



Removing the LCD Panel

24. Recycle the backlight and LCD panel.

Index

1394 port 1–11

A

arrow keys 1–13
audio troubleshooting 2–23
audio-in jack
  location 1–8
  pin assignments A–2
audio-out jack
  location 1–8
  pin assignments A–1

B

base enclosure, spare part numbers 3–9, 3–28
battery bay 1–9, 1–18
battery light 1–7
battery pack
  removal 5–4
  spare part numbers 3–13, 3–25, 5–4
battery release latch 1–18
Bluetooth module
  removal 5–46
  spare part number 3–7, 3–22, 5–46
Bluetooth module cable
  illustrated 3–17
  removal 5–47
bottom components 1–18
Bracket Kit
  contents 3–7, 3–25
  spare part number 3–7, 3–25

C

Cable Kit
  components 3–17
  spare part number 3–5, 3–17, 3–24
cables, service considerations 4–2
caps lock key 1–13
caps lock light 1–14
CMOS clearing 1–4
components
  bottom 1–18
  front 1–6
  keyboard 1–12
  left-side 1–9, 1–10
  right-side 1–8
  top 1–14, 1–16
computer feet
  illustrated 3–16
  locations 5–9
Computer Setup
  Advanced Menu 2–6

defaults 2–2
File Menu 2–3
overview 2–1
Security Menu 2–4
Tools Menu 2–5
computer specifications 6–1
connector pin assignments
audio-in A–2
audio-out A–1
external monitor A–3
RJ-11 A–5
RJ-45 A–4
S-Video-out A–6
Universal Serial Bus (USB) A–2
connectors, service considerations 4–2

D

design overview 1–20
Digital Media Slot 1–11
Digital Media Slot light 1–11
disassembly sequence chart 5–2
diskette drive
OS loading problems 2–21
precautions 4–3
display assembly
removal 5–28
spare part numbers 3–3, 3–25, 5–28
specifications 6–3
Display Hinge Kit, spare part number 3–15, 3–25, 5–31
display hinge support, removal 5–50
display hinges, removal 5–37
display inverter board
removal 5–35
spare part number 3–15, 3–25, 5–31, 5–35
Display Label Kit, spare part number 3–15, 3–27, 5–31
display panel
removal 5–35
spare part numbers 3–25
Display Panel Kit, spare part number 3–15, 5–31, 5–35
Display Plastics Kit
components 3–15
spare part number 3–15, 3–25, 5–31
display release latch 1–7
Display Screw Kit, spare part number 3–15, 3–25, 5–31
docking device, troubleshooting 2–16
drive light 1–7
drives, preventing damage 4–3
DVD/CD-RW Combo Drive
OS loading problems 2–22
precautions 4–3
removal 5–16
spare part number 3–5, 3–19, 3–25, 5–16
specifications 6–6
DVD±RW and CD-RW Double Layer Combo Drive
OS loading problems 2–22
precautions 4–3
removal 5–16

spare part number 3–5, 3–19, 3–25, 5–16
specifications 6–8
DVD±RW and CD-RW Double Layer Combo Drive with LightScribe
OS loading problems 2–22
precautions 4–3
removal 5–16
spare part number 3–19, 3–22, 5–16
specifications 6–8

E

electrostatic discharge 4–4, 4–8
expansion port 2 1–11
expansion port 2 bracket
illustrated 3–27
removal 5–61
spare part number 3–7
ExpressCard assembly
removal 5–70
spare part number 3–5, 3–25, 5–70
ExpressCard bracket, removal 5–52
ExpressCard slot 1–8
ExpressCard slot bezel
illustrated 3–16
removal 5–49
external monitor port
location 1–10
pin assignments A–3

F

f1 to **f12** keys 1–13
fan assembly
spare part numbers 3–7, 3–28, 5–58
features 1–2
feet
illustrated 3–16
locations 5–9
flowcharts, troubleshooting
no audio 2–23, 2–24
no network/modem connection 2–28
no OS loading 2–17
no OS loading from diskette drive 2–21
no OS loading from hard drive 2–18, 2–19, 2–20
no OS loading from optical drive 2–22
no power 2–10, 2–12, 2–13
no video 2–14, 2–15
nonfunctioning device 2–25
nonfunctioning docking device 2–16
nonfunctioning keyboard 2–26
nonfunctioning pointing device 2–27
fn key 1–13
front components 1–6

G

grounding equipment and methods 4–7

H

hard drive
OS loading problems 2–18
precautions 4–3
removal 5–6
spare part numbers 3–9, 3–19, 3–24, 3–25, 5–6
specifications 6–4
hard drive bay 1–19
hard drive cover
illustrated 3–16
removal 5–6
headphone jack, pin assignments A–1
headset, spare part number 3–20, 3–22
heat sink assembly, spare part number 3–7, 5–58
HP remote control, spare part number 3–20

I

I/O address specifications 6–12
interrupt specifications 6–10

K

keyboard
removal 5–26
spare part numbers 3–3, 3–25, 3–26, 5–26
troubleshooting 2–26
keyboard components 1–12
keyboard frame
removal 5–20
spare part number 3–3, 3–24, 5–20
keypad keys 1–13

L

LED board
removal 5–24
spare part numbers 3–3, 3–27, 5–24
left-side components 1–9, 1–10

M

mass storage devices, spare part numbers 3–18
memory map specifications 6–15
memory module
removal 5–10
spare part numbers 3–13, 3–24, 3–27, 5–10
memory/Mini Card module compartment cover
illustrated 3–16
location 1–19
removal 5–10
microphone jack, pin assignments A–2
Mini Card module
removal 5–12
spare part numbers 3–9, 3–11, 3–13, 3–23, 3–24, 3–27, 5–12
modem connector cable
illustrated 3–17
removal 5–55
modem jack
location 1–8
pin assignments A–5
modem, troubleshooting 2–28

N

network jack
location 1–10
pin assignments A–4
network, troubleshooting 2–28
nonfunctioning device, troubleshooting 2–16, 2–25
num lock key 1–13
num lock light 1–15

O

optical drive
location 1–8, 1–18
OS loading problems 2–22
precautions 4–3
removal 5–16
spare part numbers 3–5, 3–19, 5–16
specifications 6–6
optical drive bracket, removal 5–17

P

packing precautions 4–5
password clearing 1–4
PC Card assembly
removal 5–67
spare part number 3–5, 3–25, 5–67
PC Card slot 1–11
PC Card slot bezel 3–16
plastic parts 4–2
Plastics Kit
components 3–16
spare part number 3–5, 3–16, 3–24
pointing device, troubleshooting 2–27
power button 1–15
power connector 1–8
power connector cable
illustrated 3–17
removal 5–54
power cord
set requirements B–2
spare part numbers 3–21, 3–22
power light 1–7, 1–14
power management features 1–5
power supply, spare part number 3–21, 3–22
power, troubleshooting 2–10
precautions
DVD/CD-RW Combo Drive 4–3
DVD±RW and CD-RW Double Layer Combo Drive 4–3
DVD±RW and CD-RW Double Layer Combo Drive with LightScribe 4–3
hard drive 4–3
optical drive 4–3
processor
removal 5–63
spare part numbers 3–7, 3–24, 5–63

Q

QuickLaunch buttons 1–15

R

remote control, spare part number 3–20, 3–23
removal/replacement
  preliminaries 4–1
  procedures 5–1
right-side components 1–8
RJ-11 jack
  location 1–8
  pin assignments A–5
RJ-45 jack
  location 1–10
  pin assignments A–4
RTC battery
  removal 5–15
  spare part number 3–13, 3–25, 5–15
Rubber Pad Kit, spare part number 3–24

S

Screw Kit
  contents C–1
  spare part numbers 3–15, 3–20, 3–27, 5–31, C–1
screw listing C–1
SD Memory Card, spare part numbers 3–13, 3–22, 3–23
security cable slot 1–10
serial number 3–1, 5–1
service considerations 4–2
speakers
  location 1–7
  removal 5–65
  spare part number 3–9, 3–24, 5–65
specifications
  computer 6–1
  display assembly 6–3
  DVD/CD-RW Combo Drive 6–6
  DVD±RW and CD-RW Double Layer Combo Drive 6–8
  DVD±RW and CD-RW Double Layer Combo Drive with LightScribe 6–8
  hard drive 6–4
  I/O addresses 6–12
  interrupts 6–10
  memory map 6–15
  optical drive 6–6
  system DMA 6–16
static shielding materials 4–8
S-Video-out jack
  location 1–10
  pin assignments A–6
switch cover
  removal 5–18
  spare part numbers 3–3, 3–25, 5–18
system board
  removal 5–48
  spare part numbers 3–7, 3–24, 3–27, 5–48
system DMA 6–16
system memory map 6–15

T

thermal module, spare part number 5–58

thermal paste
replacement 5–62
spare part number 3–7
tools required 4–1
top components 1–14, 1–16
top cover
removal 5–39
spare part number 3–5, 3–25, 5–39
TouchPad bracket, spare part number 3–5, 3–25, 5–39
TouchPad cable
illustrated 3–17
removal 5–45
transporting precautions 4–5
troubleshooting
audio 2–23
Computer Setup 2–2
docking device 2–16
flowcharts 2–7
keyboard 2–26
modem 2–28
network 2–28
nonfunctioning device 2–16, 2–25
OS loading 2–17
overview 2–1
pointing device 2–27
power 2–10
video 2–14

U

Universal Serial Bus (USB) port
location 1–8, 1–11
pin assignments A–2
unknown password 1–4
USB digital drive, spare part number 3–19, 3–20, 3–22
USB travel mouse, spare part number 3–20, 3–22
USB/audio board
removal 5–56
spare part numbers 3–7, 3–27, 5–56
USB/audio board cable
illustrated 3–17
removal 5–57

V

vent, locations 1–9, 1–19
video troubleshooting 2–14
volume buttons 1–15

W

Windows applications key 1–13
Windows logo key 1–13
wireless antenna
removal 5–38
spare part number 3–15, 3–24, 5–31
wireless button 1–15
wireless light 1–9, 1–15
workstation precautions 4–6